C21.5: 966/3

Vol. 966 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 17, 1978

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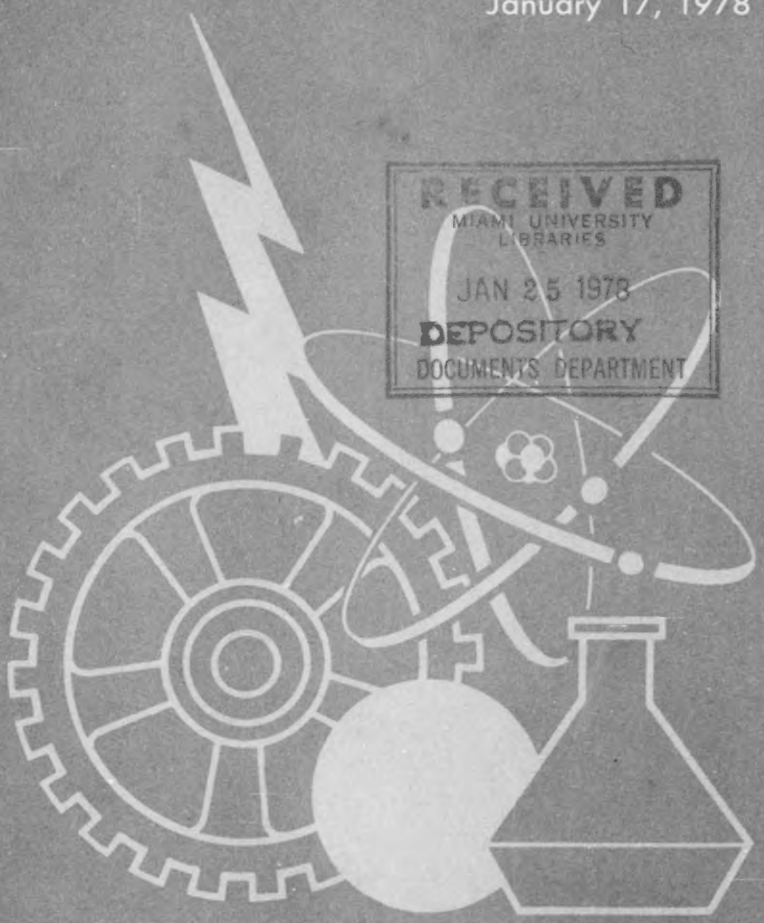

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 17, 1978 Volume 966 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

National Inventors Day

The Sixth Annual Inventors Day Exposition will be held on Saturday and Sunday, February 11 and 12, 1978 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by perspective participants. No application can be considered after January 20, 1978.

Other than electricity and allotted space—floor, wall or table top, all expenses must be borne by the exhibitor. Arrangements for delivery, return, set up and take down, as well as individual exhibits and personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office nor individual employees can accept a collect shipment or provide storage.

The Patent and Trademark Office National Inventors Day Committee will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interest are prime consideration in selecting exhibits.

Inventors or firms interested in participating are encouraged to contact the National Inventors Day Committee (phone: 557-3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attn: Oscar Mastin, Office of Information Services.

JOSEPH PETERS,
Dec. 7, 1977 *Chairman.*

National Inventors Day

The Patent and Trademark Office will be sponsoring National Inventors Day in the Public Search Room on Saturday, February 11, from 1:00 p.m. to 5:00 p.m. and Sunday February 12, 1978 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 10, 1978.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

LUTRELLE F. PARKER,
Dec. 7, 1977 *Acting Commissioner of Patents and Trademarks.*

Patent and Trademark Office Advisory Committee

Notice of Renewal

In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. I and Office of Management and Budget Circular A-63 of March 1974, and after consultation with OMB, it has been determined that the renewal of the Patent and Trademark Office Advisory Committee is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in December 1975 (40 FR 54600, November 25, 1975), and it was to terminate on December 14, 1977. Its purpose was to continually advise the Patent and Trademark Office on matters concerning the patent system and the administration of the Office. The Committee has been successful in achieving this objective. Its recommendations, most of which have been accepted or are currently being studied by the Office, have meaningfully contributed to the strengthening of the patent system.

In renewing the Committee, it has been determined that the original objective of advising the Commissioner on patent related matters was important and worth continuing. The patent system has a significant impact on the development of new technology and thereby on the domestic and international economies. The Commerce Department and the Patent and Trademark Office are continually faced with a broad range of policy questions as a result of pending patent legislation, patent treaties, court decisions, and other possibilities for change. Expert advice is needed from the private sector on patents, and neither the Department nor the Office have any other advisory committee that can perform this function.

The makeup of the Committee will continue with a balanced representation of at least 8 but no more than 15 members drawn from independent and corporate inventors, patent attorneys, corporate executives, corporate research directors, members of the judiciary, consumer representatives, economists, journalists, and educators, appointed by the Secretary of Commerce.

Copies of the Committee's revised charter will be filed with appropriate committees of the Congress.

Inquiries or comments may be addressed to the Committee Control Officer, Herbert C. Wamsley, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone 703-557-3071.

Dated: Dec. 6, 1977. GUY W. CHAMBERLIN, JR.,
Assistant Secretary for Administration.

[FR Doc. 77-35254; Filed 12-8-77; 8:45 am]

Examination

Pursuant to the provisions of 37 C.F.R. 1.341(c), an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys or agents will be held on Tuesday, March 7, 1978.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the examination must be filed in the Patent and Trademark Office together with a $35 fee not later than January 31, 1978.

Application blanks may be obtained from the Clerk of the Patent and Trademark Office Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

Dec. 19, 1977. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks and Chairman, Committee on Enrollment.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,322,296, Re. S.N. 853,185, Filed Nov. 21, 1977, Cl. 220/273, EASY OPEN CONTAINER, Nick S. Khoury, Owner of Record: *Continental Can Company, Inc., New York, N.Y.,* Attorney or Agent: Richard D. Mason, et al., Ex. Gp.: 241

3,822,258, Re. S.N. 840,929, Filed Oct. 11, 1977, Cl. 260/243 R, 4-HYDROXY-3-(3-ISOXAZOLYLCARBAMOYL)-2H-1,2-BENZOTHIAZINE 1,1-DIOXIDES AND PROCESS FOR THEIR PRODUCTION, Harold Zinnes, et al., Owner of Record: *Warner-Lambert Company, Morris Plains, N.J.,* Attorney or Agent: Albert H. Graddis, et al., Ex. Gp.: 121

3,913,759, Re. S.N. 843,767, Filed Oct. 20, 1977, Cl. 214/77 R, WHEELCHAIR LIFT, Scott C. Deacon, Owner of Record: *Inventor,* Attorney or Agent: Harold E. Wurst, Ex. Gp.: 314

3,915,015, Re. S.N. 844,276, Filed Oct. 21, 1977, Cl. 73/432 R, STRAIN GAUGE TRANSDUCER SYSTEM, Hewitt D. Crane, et al., Owner of Record: *SRI International, Menlo Park, Calif.,* Attorney or Agent: Urban H. Faubion, et al., Ex. Gp.: 244

3,952,508, Re. S.N. 849,192, Filed Nov. 7, 1977, Cl. 60/330, CONTROL FOR FLUID COUPLING, Warren G. Bopp, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Paul S. Rulon, Ex. Gp.: 341

3,979,548, Re. S.N. 847,321, Filed Oct. 31, 1977, Cl. 428/425, POLYURETHANE COATED SAFETY GLASS, Wolfgang Schafer, et al., Owner of Record: *Saint-Gobain Industries, Neuilly-sur-Seine, France,* Attorney or Agent: John T. Synnestvedt, Ex. Gp.: 164

4,012,002, Re. S.N. 852,756, Filed Nov. 18, 1977, Cl. 242/54 R, AUTOMATIC COUPLING MECHANISM FOR HOSE REELS, Dean McDonald, et al., Owner of Record: *FMC Corporation, San Jose, Calif.,* Attorney or Agent: C. E. Tripp, et al., Ex. Gp.: 242

4,029,488, Re. S.N. 851,078, Filed Nov. 14, 1977, Cl. 65/136, METHOD OF ADJUSTING GLASS TEMPERATURE IN A FOREHEARTH, Chester K. Rhett, Owner of Record: *C. Rhett, Inc., Tukwila, Wash.,* Attorney or Agent: Arthur H. Seidel, et al., Ex. Gp.: 173

4,045,145, Re. S.N. 852,930, Filed Nov. 18, 1977, Cl. 415/89, PITOT PUMP WITH TURBULENCE ELIMINATION, Walter W. Crichlow, Owner of Record: *Kobe, Inc., Huntington Beach, Calif.,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 343

PATENT NOTICES

Certificates of Correction for the Week of Jan. 17, 1978

3,888,213	4,026,184	4,039,580	4,050,585
3,890,969	4,028,261	4,040,126	4,050,716
3,947,250	4,029,439	4,040,739	4,051,004
3,956,995	4,029,505	4,041,675	4,051,007
3,965,356	4,029,750	4,042,674	4,051,220
3,971,925	4,030,280	4,043,978	4,051,228
3,974,190	4,030,697	4,043,992	4,051,251
3,979,439	4,030,888	4,044,123	4,051,256
3,983,165	4,031,723	4,045,412	4,051,297
3,993,687	4,032,788	4,045,917	4,051,348
4,000,775	4,033,429	4,046,312	4,051,624
4,002,483	4,035,013	4,047,455	4,051,887
4,002,740	4,035,291	4,048,288	4,051,897
4,002,992	4,035,518	4,048,614	4,051,910
4,004,174	4,036,773	4,048,641	4,051,936
4,009,108	4,037,473	4,049,422	4,052,008
4,010,229	4,037,636	4,050,114	4,052,115
4,012,402	4,038,094	4,050,449	4,052,674
4,019,562	4,038,609	4,050,483	4,053,365
4,023,332	4,039,136	4,050,515	4,054,004
4,024,920	4,039,322	4,050,534	
4,025,819	4,039,393	4,050,579	

Disclaimers

3,057,449.—*James E. Thomson,* Munith, Mich. TYPEWRITER. Patent dated Oct. 9, 1962. Disclaimer filed Oct. 17, 1977, by the assignee, *Western Stamping Corporation.*

Hereby enters this disclaimer to claim 9 of said patent.

3,363,615.—*George M. Meyerle,* South Ozone Park, N.Y. SWITCHING CIRCUIT. Patent dated Jan. 16, 1968. Disclaimer filed Nov. 2, 1977, by the assignee, *BSR (USA) Ltd.*

Hereby enters this disclaimer to the remaining term of said patent.

3,368,787.—*Norman H. Sachnik* and *Jesse L. Culpepper, Jr.,* Houston, Tex. FLOW REGULATOR WITH RADIALLY EXPANDING ELASTOMERIC BLOCK. Patent dated Feb. 13, 1968. Disclaimer filed Oct. 3, 1977, by the assignee, *Vapor Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,380,470.—*Jesse L. Culpepper, Jr.* and *Norman H. Sachnik,* Houston, Tex. FLOW REGULATOR WITH RADIALLY EXPANDING ELASTOMERIC BLOCK. Patent dated Apr. 30, 1968. Disclaimer filed Oct. 3, 1977, by the assignee, *Vapor Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,884,111.—*Verna M. Leonard,* Fresno, Calif. INVERSION MAKER AND CHORD MATCHER. Patent dated May 20, 1975. Disclaimer filed Oct. 13, 1977, by the inventor.

The term of this patent subsequent to May 20, 1992 has been disclaimed.

Dedications

3,288,846.—*Riyad R. Irani* and *Kurt Moedritzer,* St. Louis, Mo. PROCESSES FOR PREPARING ORGANOPHOSPHONIC ACIDS. Patent dated Nov. 29, 1966. Dedication filed Oct. 11, 1977, by the assignee, *Monsanto Company.*

Hereby dedicates to the Public the entire term of said patent.

3,393,411.—*John Bethea McElveen,* Rutherford, N.J. PROCESS FOR DYEING PILE MATERIAL WITH VARIOUS COLORED DYES FROM A PLURALITY OF STREAMS. Patent dated July 23, 1968. Dedication filed Oct. 13, 1977, by the assignee, *Milliken Research Corporation.*

Hereby dedicates to the Public the entire term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 3, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-3-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-21-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-7-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-6-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-3-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-18-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-8-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-24-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-15-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-1-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-8-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-1-77

Expiration of patents: The patents within the range of numbers indicated below expire during December 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,962,719 to 2,966,680, inclusive

Plant Patents..... Numbers 1,991 to 2,008, inclusive

REISSUES

JANUARY 17, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

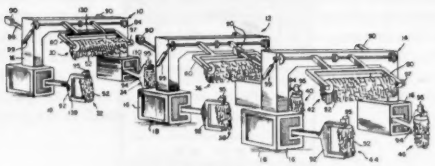
Re. 29,516
AUTOMATIC SURFACE POLISHING SYSTEM

Joseph L. Genaro, deceased, late of Fort Wayne, Ind., by Beverly Ann Genaro, administratrix, assignor to Shur Brite Wax-O-Matic, Inc., Brentwood, Tenn.

Original No. 3,774,259, dated Nov. 27, 1973, Ser. No. 144,452, May 18, 1971. Continuation-in-part of Ser. No. 13,096, Feb. 20, 1970, abandoned. Application for reissue Nov. 25, 1975, Ser. No. 635,097

Int. Cl.[2] B60S *3/06*

U.S. Cl. 15—97 B **24 Claims**



1. An automatic surface polishing apparatus comprising an applicator having a rotatable drum with one end of a fabric connected therewith, means for applying polish to said fabric, a polisher having a rotatable drum with one end of a fabric connected therewith, said fabric having a substantial surface area closely adjacent to a surface to be polished, means for effecting relative movement between a surface to be polished and said applicator and said polisher, means for automatically moving said applicator fabric into contact with a surface to be polished during relative movement between said surface and said applicator to apply polish to said surface by said applicator fabric making intermittent contact with said surface while said applicator drum is being rotated, and means for automatically moving said polisher fabric into contact with said surface during relative movement between said surface and said polisher to polish said surface by said polisher fabric making intermittent contact with said surface while said polisher drum is being rotated.

Re. 29,517
COMPOSITE WALL ELEMENT FOR THERMAL AND ACOUSTIC INSULATION

Otto Alfred Becker, Robert-Koch-Strasse 59, 66 Saarbruechen 6, Germany

Original No. 3,803,784, dated Apr. 16, 1974, Ser. No. 156,852, June 25, 1971. Application for reissue Apr. 2, 1976, Ser. No. 673,158

Int. Cl.[2] E04C *2/36*

U.S. Cl. 52—173 R **16 Claims**

1. In a composite wall element for thermal and acoustic insulation of walls, ceilings, floors and the like, comprising:

a. an outer wall element, said outer wall element being pressure resistant and imparting to the composite wall element the requisite structural strength and integrity,

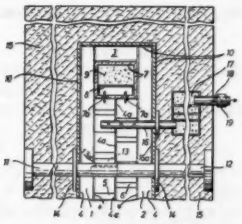
b. an inner insulating wall element positioned within and enclosed by said outer wall element, said inner insulating wall element including

1. an outer continuous covering fitting tightly within said outer wall element, said covering being provided on its inner surface with means for vapor-tight sealing said covering,

2. first spacer means lining the interior of said covering and said sealing means to impart the desired shape and rigidity to said covering, the inwardly facing surfaces of said spacing means being provided with reflecting means which reflect toward the inner cavity formed by said spacer means,

3. a reflective foil positioned within said cavity and space from said reflecting means,

4. a plurality of spaced, second spacer means positioned on either side of said reflective foil and extending between



said foil and said reflecting means, said second spacer means forming radiation chambers, and

c. passage means communicating the interior of said composite element with the exterior thereof whereby a supply of air may be admitted to and exhausted from said radiation chambers.

Re. 29,518
STIRLING CYCLE HEAT ENGINES

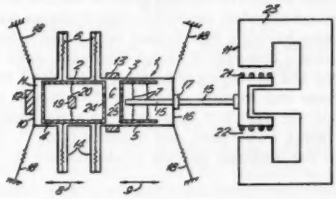
Ernest Franklin, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Original No. 3,802,196, dated Apr. 9, 1974, Ser. No. 271,713, July 14, 1972. Application for reissue May 26, 1976, Ser. No. 690,298

Claims priority, application United Kingdom, Aug. 2, 1971, 36317/71

Int. Cl.[2] F02G *1/04*

U.S. Cl. 60—520 **22 Claims**



1. A Stirling cycle heat engine comprising hot and cold variable volume chambers intercommunicating through a regenerator through which gas is displaced between the chambers in a reciprocating manner, a closed vessel of cylindrical form, a gas-displacer member and a gas-actuated member disposed in tandem *and located independently of one another so as to be free of frictional sliding movement relative to each other and* with at least one of said [chambers] *members* disposed within the vessel, resilient supports for flexibly supporting the members *so that they are out of frictional contact with the vessel and arranged so that at least one of the members is supported radially by the resilient supports*, the resilience of said supports permitting working movement of the members by oscillation towards and away from each other, one of the hot and cold chambers being formed between one of said members and the

adjacent end of the vessel and the other of said hot and cold chambers being formed between adjacent parts of the two members, and means for converting oscillating movement of one of the members into useful work.

Re. 29,519

PUMPS

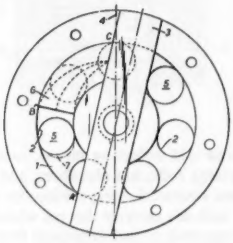
George William Pearson Scott, Stroud, and Kenneth Henry Lloyd, Gloucester, both of England, assignors to Severn Pumps Limited, Great Britain

Original No. 3,818,803, dated June 25, 1974, Ser. No. 307,942, Nov. 20, 1972. Application for reissue June 25, 1976, Ser. No. 699,688

Claims priority, application United Kingdom, Nov. 24, 1971, 54303/71

Int. Cl.[2] I01B *13/04*

U.S. Cl. 91—499 16 Claims



1. An axial piston pump adapted for pumping concrete or other abrasive media and slurries, including a cylinder block with an annular array of axially parallel cylinders, each with a reciprocable piston therein and a working end face to which the cylinders open; bearing means for locating said block in an axially fixed position; means co-operating with said face to divide it into an inlet and a delivery side; means for reciprocating the pistons to give them suction strokes on the inlet side and pressure strokes on the delivery side, the strokes commencing at an upstream end and finishing at a downstream end of the respective side to draw and discharge media progressively into and from the cylinders; guide means disposed in the circumferentially downstream portion of the inlet side, leaving the upstream portion of the inlet side free and the full diametral extent of said cylinders exposed in that upstream portion, said guide means having a first surface facing said cylinder block and forming a convergent tunnel therewith, open at the upstream end and narrowing in height **[**and width**]** towards the downstream end to urge media carried towards said guide means into the cylinders by a wedging action, and a second surface facing away from said cylinder block to reject and return to the upstream portion solids that are not correctly sized and/or positioned for entry into the cylinders in the downstream portion.

Re. 29,520

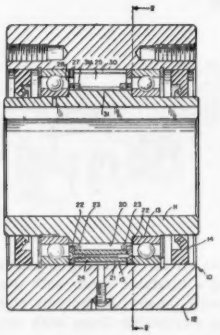
SPRAG ASSEMBLY FOR ONE-WAY CLUTCHES

Bryan P. Kent, Hinsdale, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Original No. 3,545,581, dated Dec. 8, 1970, Ser. No. 785,103, Dec. 19, 1968. Application for reissue Nov. 12, 1976, Ser. No. 741,325

Int. Cl.[2] F16D *41/07, 43/14*

U.S. Cl. 192—45.1 10 Claims



1. A sprag assembly for one-way overrunning clutches having an inner and an outer race comprising a sprag cage for retaining sprags between the inner and the outer races, a series of sprags rotatably mounted in said cage and about axis fixed with respect to the cage, said sprags having inner and outer race cam surfaces normally engaging the inner and outer races respectively when rotated in one direction to provide a drive between said races and tending to disengage and drag on adjacent races in the other direction to provide a nondriving overrunning condition between said races, *friction drag means between said cage and one of said races,* and means in engagement with said sprags for urging said sprags rotatably in said one direction, said sprags having a counterweight portion for rotatably urging said sprags in the other direction under the effects of centrifugal force when said cage is rotated in overrunning condition with *said* one of said races for overcoming the effects of said sprag engaging and urging means at a predetermined rotational speed to cause said sprags to completely disengage from said races during overrunning above said predetermined speed.

PLANT PATENTS

GRANTED JANUARY 17, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,187
SCHEFFLERA

John Mastaler, Hialeah, Fla., assignor to Schefflera, Unlimited Inc., Coconut Grove, Fla.

Filed June 16, 1976, Ser. No. 696,543
Int. Cl.[2] A01H *5/12*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Schefflera Plant of the species *Brassaia actinophylla* substantially as herein shown and described characterized particularly as to novelty by the overall variegation of leaves, stems, and trunk from green to yellow and with stems of rosy marbled appearance, close noded position of stems and compact upright rapid growth, with leaves of leathery, thick form, vigorous growth with leaves continuing to hang on at lower portion of plant.

4,188
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 13, 1976, Ser. No. 732,190
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., known by the cultivar name Circus and particularly characterized as to uniqueness by the combined characteristics of flat inflorescence form; daisy inflorescence type; lavender-pink ray floret color, with minimum color oxidation; yellow-green (immature) to yellow (mature) disc floret color; uniform nine week flowering response to photographic short day control; diameter across face of inflorescence up to 70 mm. at maturity; medium plant height; and semi-spreading branching pattern.

4,189
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Wertherstrasse 112, 4294 Isselburg, Germany

Filed Nov. 30, 1976, Ser. No. 746,223
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of african violet known by the cultivar name New York and particularly characterized as to uniqueness by the combined characteristics of intensive violet-blue flower color which doesn't fade; relatively large flower size; strong and upright stems; compact growth habit; medium green leaves; long blooming period, and the saleability of the plant after the first flash of flowers.

4,190
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 31, 1977, Ser. No. 764,002
Int. Cl.[2] A018 *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens known by the cultivar name Betsy Ross and particularly characterized as to novelty by the combined characteristics of compact growth habit with close internodes; thick and large foliage which is variegated, having central portions which varies from light yellow to cream depending on light conditions; light pink flowers and by its long lasting characteristic.

4,191
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 31, 1977, Ser. No. 764,011
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant known by the cultivar name Patriot and particularly characterized as to uniqueness by the combined characteristics of distinct white flower color at maturity, with the flower being close to the foliage; large variegated foliage with close internodes, and slow growth and compact habit.

4,192
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 31, 1977, Ser. No. 764,012
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens known by the cultivar name Monticello and particularly characterized as to uniqueness by the combined characteristic of distinct variegated pattern of foliage; excellent and fast growth; good branching habit and white flowers in which the top petal tends to be spaced or isolated from the remaining four petals, and its tolerance to outdoor environments.

4,193
IMPATIENS PLANT—AZTEC

John J. Ryan, 39877 Sundale Drive, Fremont, Calif. 94538

Filed Mar. 28, 1977, Ser. No. 782,282
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens as described and illustrated known by the cultivar name Aztec, and particularly characterized by a distinctive clean-cut variegation; excellent breaking action; a dark, yet bright red flower with a white eye, usually ringed with a bluish tint; flowers well with good duration; and makes a very good basket plant and productive stock plant.

4,194
IMPATIENS PLANT—HOPI

John J. Ryan, 39877 Sundale Drive, Fremont, Calif. 94538

Filed Mar. 28, 1977, Ser. No. 782,283
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name Hopi, and particularly characterized by short internodes, a small abundant very bright red-orange flower, a glossy bright green spreading foliage; quite sodium sensitive; yet excellent breaking action making a very full basket.

PATENTS

GRANTED JANUARY 17, 1978

ERRATA

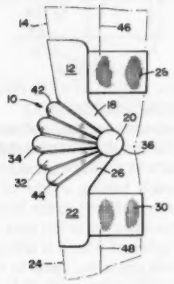
For CLASS	See PATENT NO.
122-034	4,068,627
294-067 R	4,068,971
283-049	4,068,972
270-052.5	4,068,973
401-150	4,068,974
415-080	4,068,975
051-434	4,069,025
062-003	4,069,028
062-051	4,069,028
423-105	4,069,315
560-001	4,069,381
134-057 D	4,069,425
220-003.2	4,069,448
364-474	4,069,488

PATENTS

GRANTED JANUARY 17, 1978

GENERAL AND MECHANICAL

4,068,312
ATHLETIC KNEE GUARD
Thomas Ledesma, 774 N. 16th St., San Jose, Calif. 95112
Filed Nov. 10, 1976, Ser. No. 740,564
Int. Cl.[2] A41D *13/06*
U.S. Cl. 2—24 **8 Claims**



1. A knee guard useful for protecting an athlete's knee from injury, comprising:

a first rigid shell of generally hemicylindrical shape for resting generally matingly against a front portion of a person's leg slightly above the person's knee, said first shell including a pair of arms extending generally downwardly and rearwardly therefrom, each to a respective position on opposite sides of said knee;

a second rigid shell of generally hemicylindrical shape for resting generally matingly against a front portion of a person's leg slightly below the person's knee, said second shell including a pair of arms extending generally upwardly and rearwardly therefrom, each to a respective one of said positions on opposite sides of said knee;

means for attaching said first shell above the person's knee;

means for attaching said second shell below the person's knee;

a plurality of rigid generally arcuate bars, each extending from a respective one to a respective other of said positions on opposite sides of said knee with a central portion of each bar forward of said knee, said central portions being progressively spaced one after another from said first rigid shell to said second rigid shell, said arcuate bars abutting one another to form a continuous guard surface from said first shell to said second shell when the person's knee is straightened, an uppermost one of said arcuate bars abutting said first shell and a lowermost one of said arcuate bars abutting said second shell when the person's knee is straightened;

a pair of pivot means, one at each of said positions, each pivot means pivotally connecting a respective arm of said first shell, a respective arm of said second shell and a respective end portion of each of said arcuate bars to pivot thereabout; and

fabric interconnecting successive of said arcuate bars to one another and further connecting the uppermost one of said arcuate bars to said first rigid shell and connecting the lowermost one of said arcuate bars to said second rigid shell.

4,068,313
ARTICLE OF CHIDRENS PROTECTIVE CLOTHING IN COMBINATION WITH AN ARTICLE OF USE
Diana Goldman, Tower East Apt. 22B, 190 E. 72nd St., New York, N.Y. 10021
Filed Nov. 2, 1976, Ser. No. 737,906
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—49 R **6 Claims**

1. An object-retaining baby's bib comprising:

a bib having front and back surfaces and having an opening defined therein;

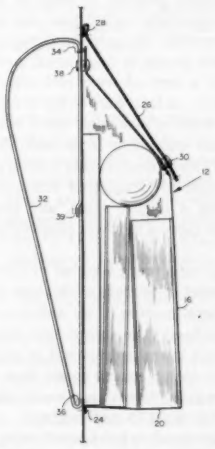
means for reinforcing said opening;

flexible inelastic cord means having first and seconds ends;

a toggle permanently secured to said first end of said cord means, said toggle being adapted to be inserted through said opening from said front surface and be detachably engaged by said back surface, whereby said cord means is suspended along said front surface;

an article of use permanently secured to said second end of said cord means.

4,068,314
JACKET WITH BACK PACK
Richard C. Yellen, Rochester, N.Y., and Edward A. Morrell, Wendell, N.C., assignors to Champion Products Inc., Rochester, N.Y.
Filed Mar. 15, 1976, Ser. No. 666,620
Int. Cl.[2] A41D *1/00*
U.S. Cl. 2—94 **15 Claims**



1. In a garment of a type which can be worn as a jacket or

similar article of apparel and which includes a storage pack carried on a back portion thereof, the improvement comprising

a storage pack formed from back, side and bottom panels which are secured to an outside surface of a back portion of said garment so as to provide, with said back portion of the garment, an enclosed structure having an open top for receiving a load therein,

a pair of shoulder straps secured to said back portion of said garment and comprising a pair of loop structures which can be placed over the shoulders and under the arms of a user when the garment is worn, said straps being secured to said back portion of the garment at points which provide support for upper and lower corners of both sides of said storage pack to thereby (a) distribute load forces from the storage pack to both of the straps and (b) prevent lateral shifting of upper and lower ends of the storage pack when a load is contained therein, and

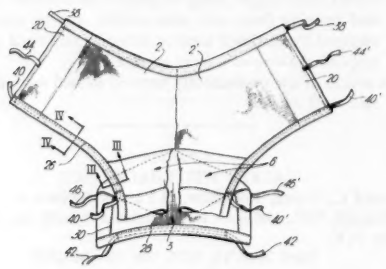
releasable fastening means carried on said back panel of said storage pack proximate the open top thereof for securing the back panel to said straps to thereby suspend any load forces on the back panel from said straps.

4,068,315

MULTI-LAYERED GARMENT FOR THE LOWER BODY

Lucien G. Rainville, 2057 - 31 Jasmine Crescent, Ottawa, Ontario, Canada

Filed Nov. 4, 1976, Ser. No. 738,964
Int. Cl.[2] A41B 9/00
U.S. Cl. 2—114 **5 Claims**



1. A multi-layered garment for the lower body for use primarily by bedridden patients, at least an inner layer thereof being moisture absorbent and at least one layer thereof being moisture impermeable, the garment comprising:

two lateral side panels of pentagonal configuration secured together by a central seam and which are together to cover the rear, at least part of the abdomen, and sides of a user from waist to mid-thigh when worn,

a central panel extending from said lateral side panel in generally T-configuration, said central panel being formed of two panels of pentagonal configuration secured together along a central seam, and being secured along upper edges thereof to lower edges of said two lateral side panels,

said central portion being adapted to cover the crotch area, and the insides of the legs of the user down to mid-thigh, and the frontal portion of his abdomen to his waist,

and means unfixedly to secure said central panel to side edges of said lateral side panels in partially overlapping relationship along spaced apart lines of joinder which extend along the frontal portion of the abdomen of the user from his waist to mid-thighs,

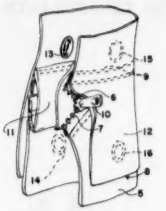
said lateral side panels when opened being of a lateral dimension to receive the user when rolled on his side and to provide a towelling and cleaning aid.

4,068,316

CONVERTIBLE SHIRT

Jay L. Haywood, Clancey, Mont., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 25, 1977, Ser. No. 762,458
Int. Cl.[2] A41B 1/08
U.S. Cl. 2—126 **2 Claims**



1. A convertible shirt, comprising

a pair of long sleeves each severed above the elbow whereby a pair of short sleeves extend from the shirt and a pair of arm covering parts are independent therefrom;

a pair of zippers each having a pair of cooperating tooth strips one of which is affixed to the inside of a corresponding one of the short sleeves in the area of the severed edge thereof and the other of which is affixed to a corresponding one of the arm covering parts in the area of the severed edge thereof whereby each of the zippers releasably affixes a corresponding one of the arm covering parts to a corresponding one of the short sleeves whereby when the zippers are zipped the shirt is longsleeved and when the zippers are unzipped the shirt is shortsleeved, each of the short sleeves extending beyond the zipper thereof;

a pair of flaps each affixed to the inside of a corresponding one of the short sleeves and extending between the corresponding one of the zippers and the arm of a wearer; and

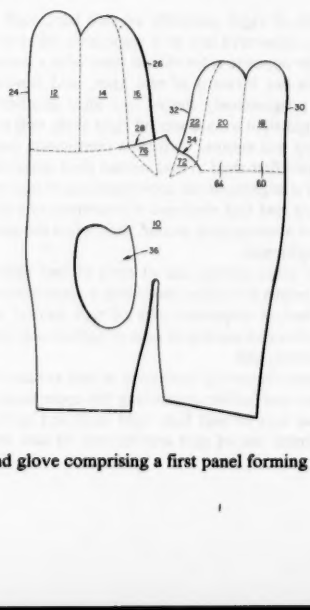
releasable fastening means affixed to the short sleeves in spaced relation with each other for forming inside cuffs for releasably covering each of the zippers when the short sleeves are the extremities of the shirt.

4,068,317

GLOVE

Stefan Roeckl, Auf der Sonnenlang 8, 8021 Icking, Germany

Filed Mar. 3, 1976, Ser. No. 663,628
Int. Cl.[2] A41D 19/02
U.S. Cl. 2—169 **9 Claims**



1. A hand glove comprising a first panel forming a covering

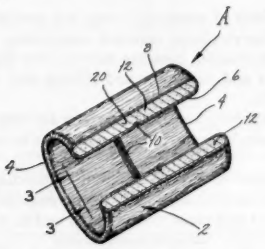
for the palm, sides and lateral portions of the back of the hand and forming stalls for the index and small fingers, a second panel forming a stall for the thumb, secured about an opening for the thumb provided in said first panel, and a third panel secured to said first panel forming a covering for the central area of the back of the hand and forming stalls for the second and third fingers, said third panel including six panel sections integral with the bases of the stalls for the second and third fingers for fitting over the canted areas of the crotches between each of the fingers on the back-hand side of the hand, first and second of such panel sections being secured together between the second and third fingers, third and fourth of such panel sections being secured to the base of the stall for the index finger between the index finger and second finger, and fifth and sixth such panel sections being secured to the base of the stall for the small finger between the third and small fingers.

4,068,318

WRIST BAND CONTAINING AN ANTISLIP COMPOSITION

William P. McMahon, 14416 Marmont, Chesterfield, Mo. 63017

Filed Sept. 8, 1976, Ser. No. 721,201
Int. Cl.[2] A41D *19/02*
U.S. Cl. 2—170 **13 Claims**



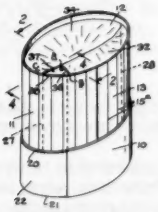
1. A wrist band comprising: a flexible cover capable of assuming an annular configuration and being sized to fit around one's wrist or arm, the cover having an interior pocket therein and further having openings between the pocket and the exterior of the cover; and an antislip composition in the pocket of the cover and being releasable through the openings in the cover so one may apply the antislip composition to his hand, to a racket handle, or to some other object brought against the cover.

4,068,319

CHEF'S HAT

Gilbert B. Wagenfeld, Bala Cynwyd, Pa., assignor to Cellucap Manufacturing Co., Philadelphia, Pa.

Filed June 9, 1976, Ser. No. 694,181
Int. Cl.[2] A42B *1/22*
U.S. Cl. 2—197 **12 Claims**



1. A disposable chef's hat comprising a head band part, a side wall part extending vertically above the upper edge of said head band part and a crown part secured to the upper marginal portion of said side wall part, all of said parts being respectively formed of individual rectangular blanks of flexible sheet material cut to equal lengths and joined together along parallel lines extending horizontally about the peripheral extent of the hat with the corresponding ends of all of said blanks in vertical registry, said joined blanks being commonly creased along a pair of vertically extending lines spaced apart a distance less than half the overall length of said blanks to provide a flat folded assembly thereof having opposite side panels extending from front to rear of the hat, one of said side panels being continuous in length and the other being split between said crease lines to provide it with a pair of sections of unequal length disposed in overlapping relation, and wherein:

a. said head band part of the hat is horizontally folded upon itself to provide an outer panel of uniform depth having downwardly and upwardly turned inner portions freely overlying the inner face of said outer panel, the overlapping end sections of said head band being telescopically interengaged for adjustment thereof to a selected head size,

b. said side wall part of the hat, formed of a material of substantially greater flexibility than that of said head band, is folded upon itself to provide it with a plurality of closely related vertical pleats spaced about the full circumferential extent thereof and has its bottom edge portion secured to said upwardly turned inner portion of the head band so that it extends upwardly beyond the upper edge of said head band to provide the hat with a side wall of substantial height rising as a vertical extension of said head band, and

c. said crown part, formed of a material having a flexibility at least as great as that of said pleated side wall part, is disposed interiorly of said hat with its flat folded sections respectively disposed in overlying relation to the corresponding flat-folded sections of said side-wall part and its top horizontally extending marginal portion secured throughout the full length thereof to the corresponding top marginal portion of said side wall part of the hat, said crown part depending freely from its said secured top marginal portions thereof to a level intermediate the horizontally extending top and bottom edges of said side wall part of the hat, the longer one only of the overlapped sections of the split side panel of said crown part having its depending horizontally extending bottom marginal portion thereof secured along the full extent thereof to the corresponding marginal portion of that section of the opposite side panel of said crown part which extends continuously between the aforesaid vertically extending crease lines of the hat whereby when said hat is expanded from its flat folded condition into a generally circular head-fitting shape the sections of the opposite side panels of the crown part which have their marginal bottom portions secured together are drawn into a position extending generally flat-wise across the top of the expanded hat while the remaining unjoined portions of said crown part are relatively spread apart to provide an opening for ventilating the interior of the hat.

4,068,320

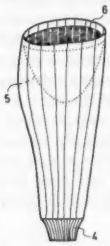
METHOD OF PRODUCING KNITTED SLACKS

Frantisek Machacek, Strelice; Vladislav Bezemek, Brno; Dusan Kudlacek, Brno; Lubomir Kliment, Brno; Arnost Pirek, Brno; Vladimir Smejkal, Brno; Frantisek Svoboda, Brno, and Stanislav Vach, Brno, all of Czechoslovakia, assignors to Vyzkumny ustav pletarsky, Brno, Czechoslovakia

Filed Mar. 31, 1976, Ser. No. 672,241
Claims priority, application Czechoslovakia, Apr. 2, 1975, 2232/75
Int. Cl.[2] A41D *1/06*
U.S. Cl. 2—227 **6 Claims**

1. Method of producing knitted outerwear slacks of thermoplastic fibers, of permanently finished natural fibers, or of a thermoplastic and natural fiber blend, comprising knitting on a medium diameter circular knitting machine to seamless tubular knitted fabrics one after another, the circumference of the fabric being equal to one trouser leg circumference, the trouser legs having at least at one of their ends a double welt, separately heat molding said tubular knitted fabrics on individual

molds to the final shape of the trouser legs, and then connecting both trouser legs together by one seat seam in the slacks seat and crotch portion, cutting away the remaining material



between said seam and the waistline of said slacks to form the crotch portion, and finishing the slacks by making-up operations.

4,068,321

ADJUSTABLE PANTS

Brigitte S. Chayer, Arvida, Canada, assignor to Robert Laliberte, Chicoutimi, Canada

Filed Sept. 24, 1975, Ser. No. 616,444
Int. Cl.[2] A41D *1/06*
U.S. Cl. 2—227 **3 Claims**

1. A pair of adjustable maternity pants made of substantially non-stretchable material, comprising a lower body wrapping section having a rear part and two frontal upper flaps adapted to overlap upon each other over the abdomen of the body, each flap being trianguloid in shape and extending from the side of the said rear part, the said trianguloid flaps being fixed to each other at a point corresponding to their apex and adapted to have the said apex at about the crotch of the body wearing the said pants and the base of said trianguloid at about the waist of said body, the free side of each flap being adapted to be normally directed diagonally in the general direction of the side of the hips, the free side of the rearward flap being generally outwardly curved, fastening means extending between the apex and the said base and mounted on the forward and the rearward flaps for releasably fixing the forward flap over the rearward flap, the said fastening means comprising two releasably connected parts, one of said parts being permanently provided along the edge of the forward part and the other of said parts being releasably fixed to the rearward flap, in a position corresponding to the convexity of the abdomen,

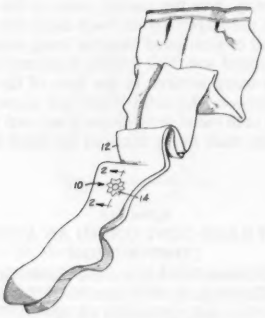
whereby the said other part of said fastening means is adapted to be displaceably fixed to the rearward flap along a radial line having its center at about the said apex of the flaps, to allow the two flaps to overlap in a plurality of fan-like positions to adjust to a plurality of convex protuberances of the abdomen while providing a firm sidewise and forward support for the abdomen in each position.

4,068,322

PANTYHOSE MENDER

Lori A. Rathel, 1035 Sutter St., Apt. 34, San Francisco, Calif. 94109

Filed Nov. 26, 1976, Ser. No. 745,055
Int. Cl.[2] A41B *11/02*
U.S. Cl. 2—239 **5 Claims**



1. The method of mending a snag in a pantyhose which is formed of a thermoplastic material, comprising

placing a decorative mending device over the snag on the outside of said pantyhose and affixing said device to said pantyhose,

placing a matching backing piece over the snag on the inside of said pantyhose and affixing said piece to said pantyhose, and

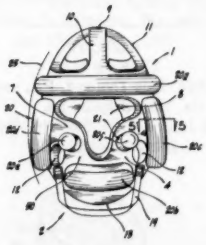
applying pressure to said decorative mending device and said matching backing piece to permanently secure said device and said piece to each other and to said pantyhose.

4,068,323

ATHLETIC PROTECTIVE SYSTEM

Pu Gill Gwon, P.O. Box 36, Florissant, Mo. 63033

Filed Oct. 6, 1976, Ser. No. 729,910
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—413 **8 Claims**



1. A protective helmet for use in athletic contests to protect the wearer against blows struck by an opponent in the contest, comprising:

a helmet assembly adapted to be worn on a person's head and capable of absorbing energy including resilient foam means covered by a pliable casing, said foam means defining a first plane of protection for the wearer, said helmet having at least one opening in it generally conforming to a person's eyes and nose;

a pattern of enclosed air pockets defining a second plane of protection, said second plane of protection being spaced outwardly from the plane of protection defined by said resilient foam means, said air pockets being non-ruptura-ble in normal use and being positioned on said helmet to

provide protection about the opening for said eyes and nose so that said second plane of protection effectively extends along said opening; and

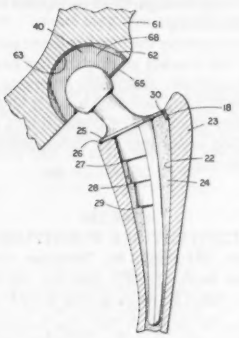
means for securing said helmet to the wearer.

4,068,324

PLATFORM SUPPORTED HIP PROSTHESIS

Charles O. Townley, Port Huron, Mich.; Allan Vegell, Warsaw, and Daniel G. Eaby, Winona Lake, both of Ind., assignors to Bio-Dynamics Inc., Indianapolis, Ind.

Filed Jan. 19, 1977, Ser. No. 760,622
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.913 **5 Claims**



1. A platform supported hip prosthesis comprising:

a. a ball head for insertion into an acetabular socket;

b. a neck connected to and having a common axis with said ball head;

c. a platform connected to said neck and oriented at an angle of about 70° relative to the common axis of said neck and said ball head to evenly distribute the forces exerted on the prosthesis during loading, said platform having a medial portion and a lateral portion;

d. and an arcuate stem, said stem being T-shaped in cross section, connected to and projecting from said platform oppositely of said neck and said ball head and proportioned for reception in the medullar cavity of a femur, said platform having a lip on the lateral portion of said platform, said lip projecting in generally the same direction as said stem and defining a recess which faces toward said stem and is adapted to compress the cement into the medullar cavity during insertion of the prosthesis to securely anchor the prosthesis and thereby resist the tendency for medial tilting during loading.

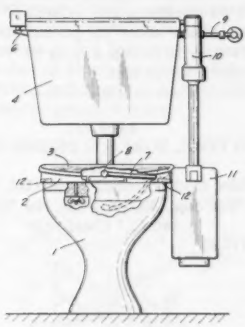
4,068,325

SPRAYING DEVICE FOR USE IN TOILETS

Johannes Benthin, Bremerhaven, Germany, assignor to MFB-Neuwerk Mechanische Fensterbehange GmbH, Bremerhaven, Germany

Filed Sept. 10, 1976, Ser. No. 722,213
Claims priority, application Germany, Sept. 13, 1975, 2540927
Int. Cl.[2] A47K *11/08, 3/22*
U.S. Cl. 4—7 **12 Claims**

1. A spraying device, particularly for use in toilets, comprising a spraying head including external wall means bounding a chamber and having at least one first and one second spraying aperture communicating said chamber with the exterior of said spraying head, and internal wall means subdividing said chamber into at least two compartments sealed with respect to one another and communicating with said first and said second spraying aperture, respectively; means for admitting spraying liquid into each of said compartments to issue therefrom through the respective spraying aperture; and means mounting said spraying head in a toilet bowl movable relative to the latter and operative for moving said spraying head between a first position in which the spraying liquid is admitted into one of said compartments to issue therefrom through said first



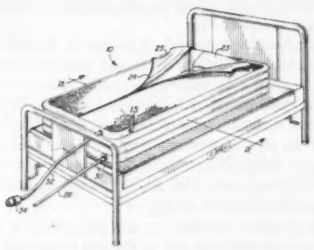
aperture and a second position in which the spraying liquid is admitted into at least the other compartment to issue therefrom through said second aperture.

4,068,326

INFLATABLE BATHTUB

Kathleen E. Deschler, 18111 Dorchester Circle, Villa Park, Calif. 92677

Filed June 9, 1975, Ser. No. 585,080
Int. Cl.[2] A47K *3/06, 3/062, 3/07, 3/23*
U.S. Cl. 4—150 **4 Claims**



1. A portable bathtub which can be pneumatically erected about a bed-ridden patient supported on the patient's bed, said bathtub comprising:

a. tub means including:

i. a floor of generally impervious material;

ii. generally tubular sidewalls secured to said floor and inflatable to define a generally longitudinal self-supporting enclosure to accommodate the patient, said floor and sidewalls in a deflated condition being portable and adapted to be supported on a bed surface along side a bed-ridden patient;

b. a cover extending from said sidewalls and across the enclosure to prevent water from splashing therefrom and to ensure patient privacy, said covering having fastening means associated therewith which can be selectively opened and closed to admit the patient into said enclosure; said enclosure defining an opening for at least the head of said patient;

c. a drain outlet attached to sid tub means connectable to a drain for selectively draining water from said enclosure; and

d. water supply means including:

i. conduit means attachable to a water source and connected to tub means;

ii. spray means connected to said conduit means and se-

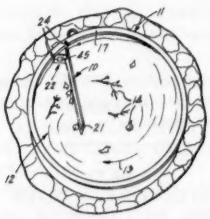
cured to one of the said cover or said sidewall means within the enclosure oriented to deliver a spray of water on the enclosed patient whereby the bathtub can be located on the bed adjacent to the bed-ridden patient in a deflated condition and inflated to a self-supporting position of use about the patient and connected to a water supply to deliver a spray of water directed onto the body of the patient.

4,068,327

SWIMMING POOL SURFACE DEBRIS SKIMMER AND METHOD

Joseph Heinlein, 15128 Chestnut Lane, Oak Forest, Ill. 60452

Filed Sept. 30, 1976, Ser. No. 728,296
Int. Cl.² E04H *3/20*
U.S. Cl. 4—172.15 **10 Claims**



1. A skimming device for removing surface debris from a swimming pool filled with water, the swimming pool having a side wall provided with an overflow drain and the water in the pool circulating in one direction, the device comprising:
an elongate skimmer bar;
means for attaching one end of the bar to the pool side wall adjacent to the overflow drain and with the bar projecting from the pool side wall divergently relative to the pool side wall and partially immersed along the length of the bar in the surface of the water to define with the adjacent area of the side wall of the pool a debris-receiving pocket having a wide mouth directed toward the circulating water to direct debris in the inflowing circulating water toward the overflow drain;
a bracket member attached to and extending in supporting relation from said one end of the bar to project across the inner end portion of said pocket to said pool side wall;
and means for attaching said bracket member to the pool side wall at a point on said wall spaced from said bar attaching means;
said bracket member being shaped to permit surface water which flows into the pocket to escape past the bracket member to the overflow drain.

6. A skimming device for removing surface debris from a swimming pool filled with water, the swimming pool having a side wall provided with an overflow drain and the water in the pool circulating in one direction, the device comprising:
an elongate bar of a vertical width ample to permit partial submersion of the bar in a horizontal position in the surface water in the swimming pool;
a mounting bracket body of generally V-shape in plan having vertically oriented horizontally extending divergently related portions;
said portions having distal end means;
attachment clip means vertically adjustably attached to said distal end means and having upper gripping jaws for releasably grippng structure at the upper end of the swimming pool wall;
and means attaching an end portion of the bar to one of said diverging portions whereby to support the bar in a generally diverging relation to the pool wall adjacent to the overflow drain for directing surface debris circulating into a pocket defined between the bar and the pool wall toward the overflow drain.

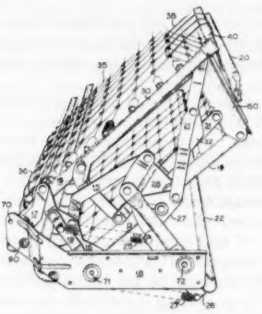
8. A skimming device for removing surface debris from a swimming pool filled with water, the swimming pool having a side wall provided with an overflow drain and the water in the pool circulating in one direction, the device comprising:
an elongate skimmer bar;
a supporting bracket on one end of the skimmer bar for supporting the skimmer bar in substantially diagonally divergent relation to the pool side whereby to define with the pool side a surface water debris-receiving pocket having a wide mouth directed toward the circulating water to direct debris laden surface water to the overflow drain;
said bracket being configured to be flipped over to a second supporting position;
and means for attaching the bracket to the pool wall in either position of the bracket so that the bar can be selectively oriented in opposite diagonally diverging relation to the pool wall by flipping over said bracket whereby to accommodate either clockwise or counterclockwise circulation of the surface water into the debris laden surface water receiving pocket.

4,068,328

CONVERTIBLE FURNITURE

William V. Gerth, 451 Phillip St., Waterloo, Ontario, Canada

Filed Sept. 27, 1976, Ser. No. 726,564
Int. Cl.² A47C *17/04, 17/14*
U.S. Cl. 5—13 **2 Claims**



1. Convertible furniture comprising in combination;
a chesterfield frame having a back, two opposite sides and a front with a level top edge thereto;
a back deck rail attached between said sides forward of the back and above the top of said front top edge;
a bed frame having a spring attached thereto and a mattress held thereon, said bed frame being collapsibly storable within said chesterfield frame below said front top edge and partly beneath said back deck rail, whereby said bed frame when stored within the chesterfield frame provides the seat cushion support for said chesterfield;
said bed frame, when collapsed, comprising an upper and lower U-shaped member disposed in spaced apart relationship by a pair of channel members, said channel members being pivotably attached to the ends of the legs of the U-shaped members;
linked mesh wire fabric attached to the U-shaped members and between them to form said bed spring and provide a mattress support therebetween; a base plate attached to each side of said chesterfield frame and having a forward and rearward end thereon;
a main torsion support tube pivotably attached to the forward end of each base plate and pivotably linked to a pair of swing levers, one swing lever being attached to one leg

of the U-shaped lower bed frame member and the other swing lever being attached to the other end of the lower U-shaped bed frame member;

a lock linkage pivotably connected between a rearward end of each base plate and one of the pair of swing levers, to provide a brace to the lower bed frame when the bed is in the unfolded position and being collapsible when the folded bed frame and mattress combination are thrust beneath the back deck rail;

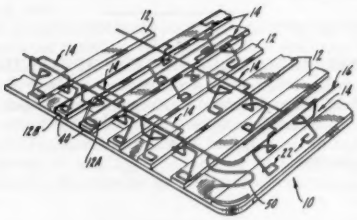
a separate support leg pivotably connected to the ends of the upper U-shaped bed frame member, said legs being storable parallel with the frame member of the bed when in the collapsed position and being extensible into load bearing position when the frames and channels are in outwardly extended by means of a linkage arm connected between the channel members and the legs.

4,068,329

MODULAR BOX SPRING ASSEMBLY

Nathan Gross, Pittsburgh, Pa., and William B. Friddle, Louisville, Ky., assignors to Restonic Corporation, Oak Brook, Ill.

Filed Oct. 4, 1976, Ser. No. 729,270
Int. Cl.[2] A47C *23/02*
U.S. Cl. 5—255 **5 Claims**



1. A box spring assembly comprising:

a. a frame;

b. a plurality of laterally supporting slats extending across said frame; said slats having a closer spacing adjacent the lateral center line of said frame with the slats disposed immediately adjacent said lateral center line having a metallic U-shaped member nesting same;

c. a plurality of elongated formed wire torsion springs having a primary torsion bar interconnecting two body portions which are affixed to said slats, said springs adjacent the lateral center line of said assembly having their primary torsion bar perpendicular to said slats, the density of said springs adjacent the lateral center line being higher than that of the springs displaced away from said center line;

d. a metal latticework mounted on said springs and affixed thereto; and

e. a fabric covering said unit.

4,068,330

WOVEN SPRING UNIT

Wallace J. Rakow; Elmer J. Millette, both of Sheboygan, Wis., and Peter J. Johnston, Conyngham, Pa., assignors to Spiller Spring Company, Sheboygan, Wis.

Filed Feb. 20, 1976, Ser. No. 659,942
Int. Cl.[2] A47C *23/02*
U.S. Cl. 5—267 **7 Claims**

1. A spring unit comprising:

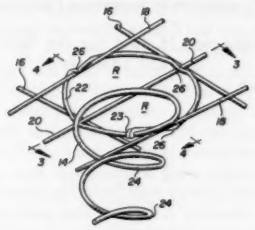
coil spring means having a generally circular top coil and lower coils;

a top grid portion having a first group or straight, undeformed wires and having a second group of straight, undeformed wires extending transversely to said first group;

said first group of wires comprising a pair of straight, undeformed wire members;

said second group of wires including straight, undeformed outside wire members spaced apart and including a straight, undeformed locking wire member located between said outside wire members and intersecting each of said wire members in said first group of wires;

said top coil including means for overlapping in a radially outward direction and engaging said outside wire members of said second group of wires;



said top coil also including means for underlapping and receiving said locking wire member at a pair of locations each adjacent the intersection of said locking wire member and a respective wire member of said first group of wires; and,

means, including said overlapping means on said top coil, for biasing the top coil into woven attachment with the top grid portion;

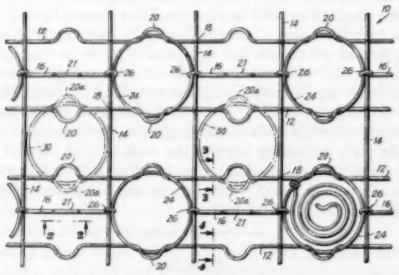
said underlapping means on the top coil and said locking wire members compising means cooperating to hold said overlapping means in engagement with said outside wires members.

4,068,331

BOX SPRING GRID AND METHOD OF MANUFACTURE

Wayne G. Dasher, Danbury, Conn., assignor to The Gilbert & Bennett Mfg. Co., Georgetown, Conn.

Division of Ser. No. 603,610, Aug. 11, 1975, Pat. No. 3,983,910.
This application May 19, 1976, Ser. No. 688,009
Int. Cl.[2] A47C *23/02*; A61J *19/06*
U.S. Cl. 5—267 **12 Claims**



1. A box spring grid which comprises:

a. a plurality of spaced apart warp wires;

b. a plurality of spaced apart fill wires, said warp and fill wires being transversely disposed and secured together at points of intersection;

c. a plurality of ears formed in each of said warp wires, each of said ears being located between a respective pair of fill wires, said warp wires being spaced apart so that corresponding pairs of ears on said warp wires are spaced apart for grippingly engaging the end coil of a spring; and

d. a plurality of support wires, each of said support wires

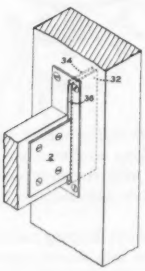
being parallel to said warp wires and extending across and being secured only to selected pairs of said fill wires, the ends of each of said support wires extending beyond the fill wires to which said support wire is secured and each of said support wires including an ear formed therein intermediate the pair of fill wires to which said support wire is attached.

4,068,332

BED LOCKING INSERT PLATES

Kirby L. Ball; Glenn S. Nance, and Roy J. Turner, all of Thomasville, N.C., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 15, 1976, Ser. No. 741,778
Int. Cl.[2] A47C *19/00*
U.S. Cl. 5—296 **1 Claim**



1. A connecting device consisting of two interconnecting members, the first interconnecting member being a plate having on its one edge two L-shaped hooks spaced one above the other in the same plane with both hooks having their openings facing in the same direction, the second interconnecting member being two parallel plates spaced apart a distance slightly greater than the thickness of the plane of the first-mentioned plate having the L-shaped hooks, pin means spanning the space between said parallel plates and flush with the exterior surface of each plate to provide engagement points for the L-shaped hooks, said L-shaped hooks engaging said pin means and said pin means passing through the openings of the L-shaped hooks and providing a resting point for said hooks, said parallel plates having right angle flanges formed with mounting means for mounting said parallel plates in position, said parallel plates are separate plates fixed at one end to the flanges which are formed from a single plate with an elongated slot therein having closed ends to permit said L-shaped hooks to pass therethrough to engage said pin means, and said parallel plates having opposite free ends, and with said fixed ends secured contiguous with the respective edges of said elongated slot along the length thereof and terminating at the ends of said elongated slot so as to be overlapped by the ends of said single plate with the ends of said single plate extending beyond the ends of said parallel plates said plate with the L-shaped hooks being fastened to the side rails of a bed, and said parallel plates are embedded in the post of the headboard of the bed.

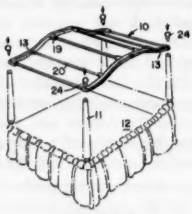
4,068,333

CANOPY FRAME FOR BED

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 631,042, Nov. 12, 1975, Pat. No. 4,004,306. This application Mar. 22, 1976, Ser. No. 669,304
Int. Cl.[2] F16B *7/10;* A47C *29/00*
U.S. Cl. 5—362 **7 Claims**

1. A canopy bed frame comprising two longitudinal members and a plurality of lateral members adapted to be interconnected adjacent the ends thereof to said longitudinal members to form a generally rectangular ladder-like frame, each longitudinal member including a pair of end-connected parts to form an arched side of said frame, each longitudinal member part being constructed of resilient plastic material and having bottom and side walls arranged to provide a generally trapezoidal shape in cross section, one part of each longitudinal member at the end thereof having a male fitting telescopically received in the adjacent end of the other longitudinal member part, the other longitudinal part at said adjacent end having a top wall



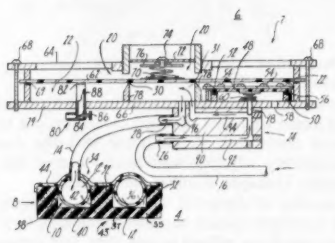
cooperating with said bottom and side walls in defining a female fitting, the walls of said female fitting having longitudinally extending inwardly directed integral ribs, said male fitting having an end wall stabilizing the side walls adjacent thereto for engagement with said ribs, and resilient lock means interconnecting said male and female fittings against inadvertent detachment.

4,068,334

INFLATABLE BODY SUPPORT APPARATUS

Nathan A. Randall, Tucson, Ariz., assignor to Harry E. Grover, Deerfield, Ill. and Richard C. Ruppin, Detroit, Mich.

Filed June 4, 1976, Ser. No. 692,793
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—365 **13 Claims**



1. In a body support apparatus connected to a source of pressurized fluid, the combination comprising:

a plurality of inflatable and deflatable cells providing support for a body while in an inflated condition;

control means in communication with said cells and said source of pressurized fluid for alternatingly inflating said cells by connecting said source of pressurized fluid to the cells and deflating the cells; and

a plurality of uninflated, spaced apart, support strips providing support for said body while said cells are in a deflated condition, said uninflated support strips each having first and second facing sides comprising side walls of one of said cells.

4,068,335

MATTRESS HAVING AN UPPER INTERNAL MATERIAL-CONTAINING CHAMBER

Raymond M. Phillips, 2566 Tuna Canyon Road, Malibu, Calif. 90265

Filed Sept. 17, 1976, Ser. No. 724,355
Int. Cl.[2] A47C *27/08;* B31F *7/00*
U.S. Cl. 5—371 **26 Claims**

1. A mattress for use in a rigid containing frame for support-

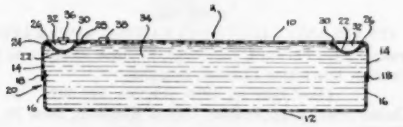
ing an individual in an inclined position and which mattress generally assumes its peripheral shape from said frame, said mattress comprising:

a. an upper sheet,

b. a lower sheet in spaced apart relationship to said upper sheet,

c. a continuous outer side wall extending between and secured in operative relationship to said upper and lower sheets,

d. a continuous panel operatively secured to said upper sheet inwardly of a peripheral end margin of said upper sheet by a first continuous seal, said panel also being secured to said upper sheet at a point in close proximity to the peripheral margin thereof by a second continuous seal to form a



material-containing chamber bounded by at least a portion of said upper sheet and said panel between said first and second seals, with a liquid chamber bounded at least by said lower sheet, said side wall, and a portion of said upper sheet, and

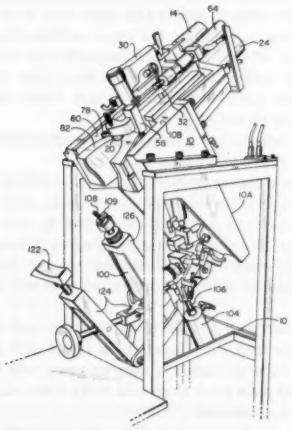
e. said material-containing chamber extending continuously around the periphery of the upper sheet and being located above the liquid chamber at least in the region between said first and second seals and effectively being on top of said liquid chamber so that it is free of certain hydrostatic pressures which would otherwise be exerted on the material-containing chamber and so that an individual reclining on said upper sheet may be peripherally supported by the material in said material-containing chamber.

4,068,336

MACHINE FOR CLAMPING THE HEEL PORTION OF AN UPPER TO THE CORRESPONDING PORTION OF A FORM

Michael M. Becka, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Dec. 6, 1976, Ser. No. 747,578
Int. Cl.² A43D *21/00*
U.S. Cl. 12—14.4 **22 Claims**



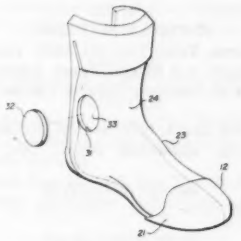
1. A machine for clamping the heel portion of an upper to the corresponding portion of a form that comprises: support means for so supporting a shoe assembly formed of a form having an upper mounted thereon that the heel of the shoe assembly faces rearwardly; a clamp pad, having a pair of legs extending forwardly and divergently from a bight, so located that the bight is rearward of the heel end extremity of the shoe assembly and the legs are located outwardly of the sides of the heel portion of the shoe assembly; pad bight mounting and operating means operable to cause the pad bight to bear against the heel end extremity of the shoe assembly; and pad leg mounting and operating means operable to cause the pad legs to bear against the sides of the heel portion of the shoe assembly; wherein the pad leg mounting and operating means comprises: a plate located outwardly of each pad leg; means mounting each plate for inward-outward movement; connecting means connecting each plate to its associated pad leg; resilient means yieldable urging the plates, together with the pad legs, outwardly into initial plate positions such that the plates are inclined forwardly and outwardly; a head associated with each pad leg mounted for forward-rearward movement in intersecting relationship with its associated plate; means for initially retaining each head in an initial head position that is rearward of its associated plate; and means for yieldably urging each head forwardly of its initial head position to thereby cause the heads to engage the plates and yieldably force the plates, together with the pad legs, inwardly of said initial plate positions.

4,068,337

ANKLE PAD FOR FOOTWEAR

Alden B. Hanson; Chris A. Hanson, and Donald W. Bertetto, all of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.

Division of Ser. No. 664,042, March 4, 1976, Pat. No. 4,019,266.
This application Feb. 7, 1977, Ser. No. 766,148
Int. Cl.² A43D *9/00*
U.S. Cl. 12—142 P **2 Claims**



1. The method of fitting a ski boot comprising a shell, a liner having a recess, and a filling material adapted to be disposed between said shell and liner; said method comprising the steps of:

inserting said liner having said recess in the shell of a ski boot;

placing in said liner recess a first pad having a density of at least the density of said liner;

inserting filling material between said liner and said shell;

removing said first pad from said recess; and, inserting in said liner recess a second pad having a density less than the density of said liner.

4,068,338

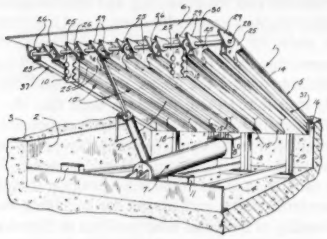
RAMP CONSTRUCTION FOR A DOCKBOARD

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Oct. 1, 1976, Ser. No. 728,636
Int. Cl.² E01D *1/00*
U.S. Cl. 14—71.3 **15 Claims**

14. In a dockboard, a supporting structure, a ramp hinged at

its rear edge to the supporting structure, and movable between a generally horizontal cross traffic position and an upwardly inclined position, a lip hinged to the forward edge of the ramp and movable between a downwardly hanging pendant position and an extended position where the lip forms an extension to the ramp, said ramp including a generally flat deck plate and a series of beams supporting said deck plate, each beam having a pair of upper outwardly diverging legs secured to the undersurface of the deck plate and each beam including a base section spaced beneath the deck plate, the width of the base section being substantially equal to the distance between the upper



ends of said legs, and a pair of hinge plates secured to the side surfaces of each beam, each hinge plate having an upper edge secured to the undersurface of the deck plate and having a side surface secured to the respective upper leg and base section of the beam, each hinge plate having a generally curved projecting forward edge projecting forwardly of the beam and the deck plate, first opening means disposed in the projecting end portion of each hinge plate and disposed to receive a hinge pin, a series of lugs connected to the lip, second opening means disposed in said lugs and aligned with said first opening means, and a hinge pin extending through the aligned first and second opening means to hinge the lip to the ramp.

4,068,339

FLEXIBLE MATTING

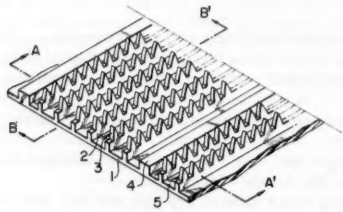
Kenjiro Maruyama, Kobe; Tsuyoshi Miki, Osaka; Yoshiyuki Nishi, Amagasaki, and Masato Takao, Takatsuki, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Dec. 4, 1975, Ser. No. 637,862

Claims priority, application Japan, Dec. 5, 1974, 49-146338[U]

Int. Cl.[2] A47L *23/26*

U.S. Cl. 15—215 **17 Claims**



1. A flexible matting adapted for cleaning shoes comprising
a one-piece mat of integrally molded flexible material inculding
a base sheet,
a plurality of tread bars substantially parallel to each other integrally molded to said base sheet at intervals shorter than the width of shoes,
a plurality of ridges having piles thereon integrally molded to said base sheet and arranged at approximately equal intervals between and parallel to said tread bars with the width of the ridges narrower than the width of the tread bars and forming grooves between said ridges and said ridges and tread bars,
whereby said ridges and piles have a flexibility requiring the support of said tread bars against an excessive pressing force on said ridges and piles,
the top of said piles being approximately 2 to 15mm higher than the upper surface of said tread bars.

4,068,340

STEAM AND VACUUM CLEANING APPARATUS

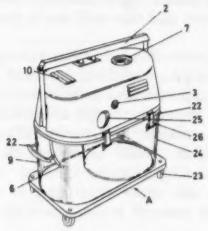
Raymond John Forward, Stevenage, England, assignor to Steam Vacuum Extraction Limited, England

Filed June 16, 1976, Ser. No. 696,507

Claims priority, application United Kingdom, June 20, 1975, 26394/75

Int. Cl.[2] A47L *7/00*

U.S. Cl. 15—321 **1 Claim**

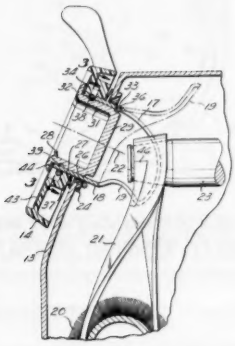


1. A hot water and vacuum cleaning apparatus comprising:
a wheeled base platform;
a transparent water tank and a transparent vacuum tank mounted on the upper portion of said wheeled base platform, said vaccum tank having a common wall with said water tank;
a main deck releasably attached to the upper portions of said tanks to enclose said tanks, said deck having separate compartments;
attaching means carried by said tanks for releasably engaging said main deck to secure said main deck to said tanks;
a pressure pump mounted on the upper surface of said main deck in one of said separate compartments above said water tank, said pump having an inlet pipe extending through said main deck and into said water tank, said pump having an outlet;
an auxiliary deck mounted in another compartment of said main deck above said vacuum tank;
a vacuum pump motor supported on said auxiliary deck;
a vacuum pump supported between said main deck and said auxiliary deck and drivingly connected to said vacuum pump motor, said vacuum pump having an inlet extending through said main deck and into said vacuum tank;
a cover retained on said main deck to enclose said compartments;
a U-shaped carrying handle having a base and a pair of downwardly extending legs which retain said cover on said main deck to permit a user to grasp said base and remove said main deck from said tanks when said attaching means are released;
first coupling means accessible through said cover for connecting a hose to said pressure pump; and
second coupling means accessible through said cover for connecting a second hose to said vacuum tank.

4,068,341
TRANSPARENT BELT LIFTER MOUNTING FOR VACUUM CLEANERS

Ernest R. Scott, Mayfield Heights, and Charles H. MacFarland, Rocky River, both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Feb. 26, 1976, Ser. No. 661,834
Int. Cl.[2] A47L 5/32
U.S. Cl. 15—339 9 Claims

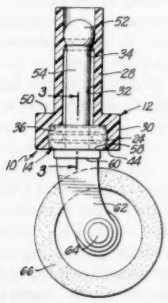


1. A vacuum cleaner comprising a housing assembly, a powered floor treatment member in said housing assembly, a motor in said housing assembly having a motor shaft, a belt operable to connect said motor shaft to said floor member for driving the latter, and a belt lifter mounted on said housing assembly rotatable about an axis from a first position in which it allows said belt to be connected to said motor shaft and a second position in which it causes said belt to be disconnected from said motor shaft, said belt lifter including rotatable shaft means supporting said belt lifter on said housing assembly for rotation about said axis between said first and second positions, said shaft means including a transparent window allowing a user to observe the position of said within said housing from a location exterior of said housing.

4,068,342
CASTER SUPPORT STRUCTURE

Vernon J. Carrier, 25830 Viana St., Lomita, Calif. 90717

Filed July 22, 1976, Ser. No. 707,842
Int. Cl.[2] B60B 33/00
U.S. Cl. 16—21 2 Claims

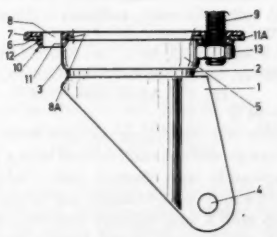


1. A caster support structure which comprises:
a housing and a bearing,
said housing being a unitary body of a polymer material shaped so as to include first and second axially aligned hollow cylinders located in end to end relationship,
said first cylinder being of smaller external diameter than said second cylinder,
said first cylinder havng an internal annular bead extending into the interior thereof,
said second cylinder having an internal cavity in the end thereof remote from said first cylinder,
said cavity constituting an enlargement of the interior of said second cylinder symmetrically located about the common axis of said cylinders in communication with the interiors of said cylinders,
said cavity having sides located perpendicular to the common axis of said cylinders and a barrel shaped peripheral wall located remote from said common axis connecting said sides,
a first of said sides of said cavity being coplanar with the end of said second cylinder remote from said first cylinder, said first side serving to expose the interior of said cavity within said peripheral wall,
at least a portion of said peripheral wall remote from said first side being located further from said common axis of said cylinders than the portion of said peripheral wall adjacent to said end of said second cylinder remote from said first cylinder,
said bearing including two generally ring shaped ball race parts, said parts being located adjacent to one another and each including a groove serving as a portion of a ball race, a series of balls located betwen said parts within said grooves and a retainer located around said parts,
said retainer fitting relative to said parts so as to hold said parts and said ball relative to one another so that one of said parts is capable of being rotated relative to the other of said parts,
the exterior of said retainer having an external barrel shape and being in direct intimate contact with said peripheral wall and so that said one of said parts is located adjacent to the end of said second cylinder remote from said first cylinder,
said retainer serving to hold said parts in parallel planes perpendicular to the common axis of said cylinders in a position in which one of said parts is exposed at the end of said second cylinder remote from said first cylinder.

4,068,343
CASTOR FORK ASSEMBLY WITH PROTECTIVE SURFACE

Hendrikus Jacobus Maria Timmer, Tiel, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed June 14, 1976, Ser. No. 695,422
Claims priority, application Netherlands, June 26, 1975, 7507593
Int. Cl.[2] B60B 33/00
U.S. Cl. 16—31 R 9 Claims



1. In a castor wheel assembly having a fork, a rolling bearing mounted to the top of the fork, said assembly having a support plate with bolt holes mounted to the top of said rolling bearing, whereby a load or carriage can be connected to one side of said support plate by bolts extending through said bolt holes, the improvement comprising a layer of relatively thin slightly deformable material on said one side of said support plate, said

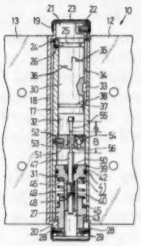
layer having hollow projections of said material extending through said bolt holes, said projections having rims of said material which resiliently engage the side of said support plate opposite said one side thereof and adjacent said holes.

4,068,344

DOOR HINGE MECHANISM

Chiyo Okabe, 19-Go, 12-Banchi, Hirano, Osaka, Japan (547)

Filed Oct. 21, 1976, Ser. No. 734,459
Int. Cl.[2] E05F *3/20*
U.S. Cl. 16—54 **7 Claims**



1. A door hinge mechanism comprising a pair of flanges each fixedly mounted on a door and a means for fixedly mounting said mechanism on said door, one of said flanges being connected to a cylinder while the other is connected to a supporting means in pivotally supported relation with respect to said cylinder, a pair of pistons mounted internally of said cylinder at a suitably spaced apart interval, a working oil filled in said pair of pistons, a movable means mounted externally of said pistons to move the latter in upward and downward directions along with the relatively opening and closing motions of said flanges, a partition mounted between said pistons, an orifice and a reversely stopping valve means formed on said partition, said valve means being adapted to be released when said flanges are moved in the opening direction thereof, a valve means formed on one of said pistons reciprocable through said orifice of the partition thereby to control the quantity of working oil to be fed through said orifice during the latter half process wherein said pair of pistons have moved in the closing direction of said flanges.

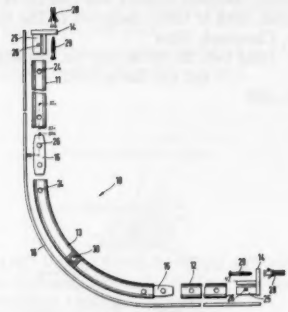
4,068,345

SHOWER CURTAIN ROD ASSEMBLY

Klaus Hehl, Remscheid-Luttringhausen, and Heike Schrankel, Wuppertal, both of Germany, assignors to Riloga-Werk Julius Schmidt, Remscheid, Germany

Filed Oct. 12, 1976, Ser. No. 731,345
Claims priority, application Germany, Oct. 16, 1975, 2546326
Int. Cl.[2] A47H *1/04, 1/44*
U.S. Cl. 16—94 D **11 Claims**

1. A curtain rod comprising: at least two elongated rail sections of like profile and each formed with a longitudinally extending upwardly open channel, with a longitudinally extending downwardly open channel, and between the respective channels with a longitudinally extending and upwardly, downwardly, and laterally closed passage having a pair of ends, each section having at least one side having an upper longitudinally extending edge and a lower edge parallel thereto, one of said ends of one of said sections being longitudinally aligned with one of said ends of the other section; a coupling element having one portion snugly longitudinally engaged in one of said one ends and another portion snugly longitudinally engaged in the other of said one ends; a mounting element engaged longitudinally snugly in the other end of one of said passages and adapted to be secured to a fixed surface; and a valance strip extending along and secured to said sides of said rails and substantially covering said sides.

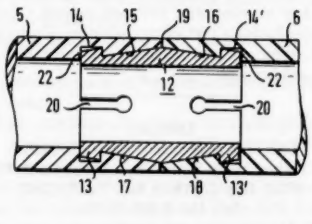


4,068,346

HANDLE FOR A HAND IMPLEMENT SUCH AS A RAKE, A BROOM, OR THE LIKE

Josef Binder, Bayerwaldstrasse 18,, 8391 Strasskirchen, Germany

Filed Dec. 9, 1976, Ser. No. 749,027
Claims priority, application Germany, Dec. 12, 1975, 2556058
Int. Cl.[2] A46B *5/00*
U.S. Cl. 16—110 R **23 Claims**

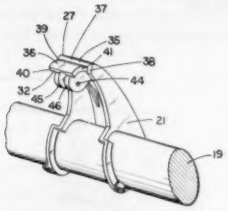


1. A handle for a hand implement, such as a rake, broom or the like, said handle being in the form of a tube consisting of at least two tubular members and a coupling member for joining the individual tubular members permanently to each other flushly and with a smooth transition at their respective confronting ends, said coupling member having a separate coupling means for engaging each tubular member at one of said respective confronting ends, each coupling means being formed as a tubular part of one single coupling member, said parts being of approximately equal length and symmetrical with respect to a transverse central plane through said coupling member, each part being non-releasably joinable to the one of the respective confronting tubular member ends by means of axially-oriented connection means in the form of engaging projections on said part for mating with axially-oriented connection means of the respective tubular member ends, in combination with conical peripheral surfaces on each said part mating with corresponding conical peripheral surfaces of the respective tubular member ends, whereby said tubular members can be manually telescopically engaged with said coupling member, thereby to effect permanent end-to-end joining of said tubular members.

4,068,347
HANDLE HINGE TO TRANSFER LIFTING FORCE IN A DIRECTION PARALLEL AND NORMAL TO MOUNTING WALL

Bennie R. Johnson, R.R. 1, and Gary L. Cox, 1920 Virginia Ave., both of Connersville, Ind. 47331

Filed Aug. 27, 1976, Ser. No. 718,152
Int. Cl.[2] A47B *45/02*
U.S. Cl. 16—112 8 Claims



8. A handle hinge mountable to a wall comprising:

a base adapted to be mounted onto said wall, said base having a first exterior stop surface and a second interior stop surface, said interior stop surface extending perpendicular to said wall;

a lifting arm having a proximal end pivotally mounted to said base;

means on said base and engaged with said lifting arm operable to allow said lifting arm to be pivoted from a downward position near said wall to an upward position away from said wall;

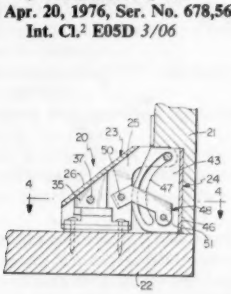
said lifting arm having a curved finger with a tip extending into said base from said proximal end and with said arm further having a ledge, said tip and said ledge being positioned to simultaneously contact respectively said interior stop surface and said exterior stop surface when said arm is in said upward position to direct at least some of said lifting force parallel to said wall; and wherein:

said lifting arm includes a plurality of mounting walls integrally secured thereto and projecting inwardly into said base adjacent said means which includes a pivot pin mounted to and extending between said base and said mounting walls.

4,068,348
FULLY CONCEALED DOOR HINGE

Thomas R. Chivers, Winston-Salem, N.C., assignor to Southern Tool Mfg. Co., Inc., Winston-Salem, N.C.

Filed Apr. 20, 1976, Ser. No. 678,567
Int. Cl.[2] E05D *3/06*
U.S. Cl. 16—129 3 Claims

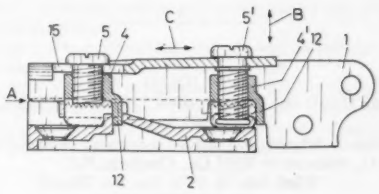


3. Hinge means for mounting a door on a fixed structure having an opening in a manner to entirely conceal the hinge means when the door closes the opening of said structure, said hinge means comprising a first hinge member, means for adjustably mounting said first hinge member on said fixed structure inwardly of said opening, including a base having longitudinally extending slots along opposite sides, said first hinge member having spaced generally parllel side walls with inwardly extending flanges adjustably received within the slots of said base, an upwardly extending web mounted on said base, at least one clamping plate located between said side walls, and means for selectively moving said clamping plate into clamping engagement with said web to hold said first hinge member in fixed adjusted position, said first hinge member having an outwardly extending portion with a guide pin mounted thereon, a second hinge member, means for mounting said second hinge member in fixed position on said door, said second hinge member having an upstanding rib with an arcuate control slot therein, at least a portion of said rib being in side-by-side relationship with said outwardly extending portion of said first hinge member so that said guide pin is located within said control slot, a connecting link swingably connected at one end to said first hinge member and swingably connected at the other end to said second hinge member, said swingable connections of said connecting link being in spaced relationship with said guide pin and said control slot at all times so that said hinge means controls the motion of said door when said door is moved and positions at least a portion of the door within the opening of the fixed structure when the door is opened.

4,068,349
HINGE

Erich Rock, Kuferstrasse 1085, A-6973 Hochst, and Bernhard Mages, Harte 10, A-6850 Dornbirn, both of Austria

Filed Apr. 5, 1976, Ser. No. 673,892
Claims priority, application Austria, Apr. 7, 1975, 2623/75; Mar. 4, 1976, 1582/76
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—131 16 Claims



1. A hinge arrangement comprising, in combination, a base plate; a hinge arm; an intermediate member between said base plate and said hinge arm; toggle joint means carried by said hinge arm, said hinge arm being anchorable in said base plate; projections on said base plate; said intermediate member comprising two intermediate elements having lugs gripping behind said projections; at least one of said intermediate elements having an extended portion extending into an opening of said base plate when the hinge arrangement is mounted in place.

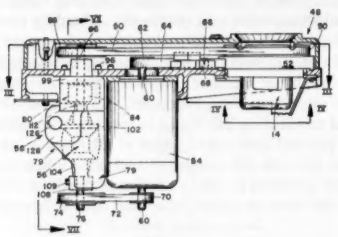
4,068,350
ARTICLE CONTOUR FOLLOWER MECHANISM

William VanAppledorn, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Continuation of Ser. No. 591,852, June 30, 1975, abandoned.
This application Nov. 22, 1976, Ser. No. 743,585
Int. Cl.[2] A22C *17/04*
U.S. Cl. 17—1 G 11 Claims

1. An article contour follower apparatus including an annular inner member and annular outer member supported for rotation about an axis in the same rotational direction and defining an opening through which an elongated article is axially movable, at least one follower member pivotally mounted to said inner annular member and said outer annular member for movement therewith, and means for shifting the relationship of said annular members with respect to each other to cause said follower member to move toward and away from the axial center of said opening to follow the contour of

an elongated article moved axially through said opening, said shifting means including: a drive means including a common drive for driving said inner and said outer annular members in the same rotational direction, said drive means also including a first drive and a second drive; said first drive being directly coupled to said common drive and to one of said annular members; said second drive being coupled to a third drive for rotating said other of said annular members; control means



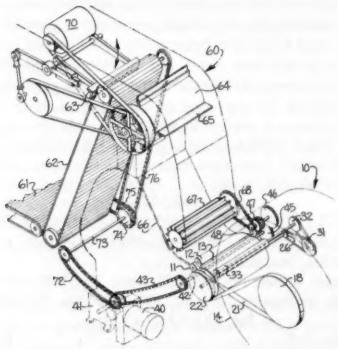
coupled between said second drive and said third drive; means mounting said control means for rotational movement relative to said second drive and said third drive whereby rotation of said control means will shift the relative rotational positions of said second and third drives causing said other annular member to rotatably shift relative to said one annular member to thereby urge said follower member to open and close toward said axial center of said opening to thereby follow the contour of an elongated article moved therethrough.

4,068,351

METHOD OF INCREASING THE CAPACITY OF A CARDING MACHINE

William J. Schmiel, and Mark O. Schmiel, both of Charlotte, N.C., assignors to RSM Co., Charlotte, N.C.

Filed July 12, 1976, Ser. No. 704,229
Int. Cl.[2] D01G *15/40*
U.S. Cl. 19—105 **3 Claims**



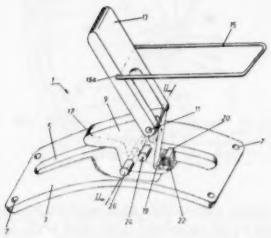
1. A method for processing fibrous material on a carding machine whereby the machine is capable of a substantially increased production capacity and with a significant reduction in maintenance, said method comprising delivering the fibrous material to the input end of the carding machine in the form of a thin, lightweight substantially non-compacted batt having a density of no more than about 75 grams per square foot, while feeding the fibrous material into the machine at a linear speed of at least about 10 feet per minute.

4,068,352

ADJUSTABLE BUCKLE FOR SKI SHOES

Ivan Uhricek, and Ruedi Schneider, both of Stafa, Switzerland, assignors to Ivan Uhricek; Schneider, Ruedi, both of Stafa and Jaroslav Vik, Uster, all of, Switzerland

Filed Apr. 4, 1977, Ser. No. 784,067
Claims priority, application Switzerland, Apr. 5, 1976, 4258/76
Int. Cl.[2] A43C *11/00*
U.S. Cl. 24—69 SK **10 Claims**



1. An adjustable buckle for a ski shoe or the like and comprising,

a base plate having means for being secured to said shoe, said plate having upper and lower surfaces, a locking holder having a shiftable connection with said base plate for shifting in a longitudinal direction relative to and on said base plate,

a locking lever swingably mounted on said holder,

a locking member swingably secured to said lever,

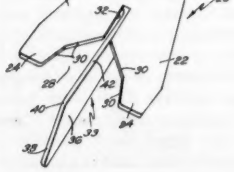
said locking holder also being oscillatingly mounted on and relative to said plate about an axis which is transverse to said longitudinal shifting direction of said holder, and locking means on said holder for releasably and simultaneously engaging said upper and lower surfaces of said base plate, whereby said holder is selectively releasably connected to said base plate by said locking means.

4,068,353

CARTON CLIP

Samuel F. Speers, North Attleboro, and James L. Pelto, Fitchburg, both of Mass., assignors to Hasbro Development Corporation, Pawtucket, R.I.

Filed Jan. 31, 1977, Ser. No. 766,766
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—81 BF **10 Claims**



1. A clip for use with a regular slotted carton having adjacent side and end foldable closure flaps, said clip being selectively usable for temporarily holding opposed side flaps in a closed position and adjacent side and end flaps in an open position, and comprising a pair of generally coplanar wings spaced from each other at forward portions thereof and interconnected at base portions thereof so as to cooperatively form a first carton contacting surface of a generally flat configuration, a longitudinally orientated leg connected to said first

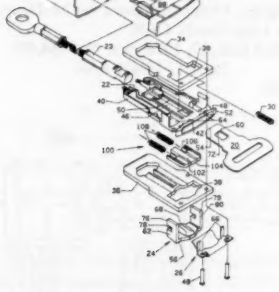
carton contacting surface at said wing base portions thereof, said leg disposed between said wings and having a relatively thin upper edge forming a second carton contacting surface having the main portions thereof generally disposed below and spaced from said first surface whereby said first surface is adapted to contact top portions of said side flaps and said second surface is adapted to contact bottom portions of one of said end flaps in said closed position, and whereby said first surface is adapted to contact bottom portions of said adjacent flaps and said second surface is adapted to contact interior wall corner portions of said carton in said alternate open position.

4,068,354

SAFETY BELT BUCKLE

Yogendra S. Loomba, Washington, and Surendra D. Narayan, Warren, both of Mich., assignors to Allied Chemical Corporation, N.J.

Filed Mar. 1, 1976, Ser. No. 662,988
Int. Cl.² A44B *11/26*
U.S. Cl. 24—230 A **6 Claims**



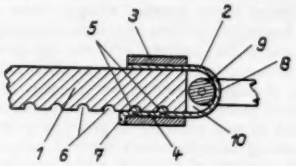
1. A vehicle safety belt buckle comprising:
a. a housing having an opening therein and provided with a cavity extending from said opening to a wall of said housing opposite said opening;
b. inlet means communicating with said cavity for receiving a tongue of a seat belt;
c. connecting means for connecting the housing to an anchorage point on the vehicle;
d. latching means having a raised portion for engaging said tongue and a plurallity of shoulders each of said shoulders having a notch therein and a forward face having a corner;
e. first biasing means connected to said housing for biasing said latching means into engagement with said tongue;
f. locking means slidably mounted on said housing for locking engagement with said latching means said locking means including a lock bar having a forward face adapted to mate with the notch of each shoulder to form said locking engagement;
g. second biasing means connected to said housing and to said lock bar for biasing said lock bar of said locking means into said locking engagement; and
h. release means slidably mounted on said housing for rotating said latching means to move said locking means out of locking engagement therewith.

4,068,355

ATTACHMENT DEVICE FOR BRACELETS AND THE LIKE

Laurent C. Rey, Avenue de Lavaux 64A, 1009 Pully VD, Switzerland

Filed June 2, 1976, Ser. No. 692,205
Claims priority, application Switzerland, June 14, 1975, 7734/75
Int. Cl.² A44C *5/18*
U.S. Cl. 24—265 R **4 Claims**



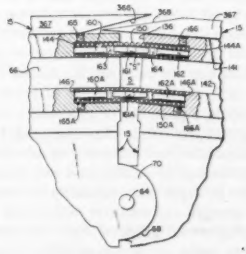
1. Apparatus for adjustably securing a connector to the end of an enlongated strip, comprising
a. an elongated strip with a flat end;
b. said flat end having a plurality of spaced first engaging means on one surface thereof; the improvement comprising
c. a securing piece comprising a body portion with opposed spaced-apart legs for engaging opposite surfaces of said flat end;
d. one of the flat end engaging surfaces of one of said spaced-apart legs having a plurality of spaced second engaging means for cooperating with said first engaging means;
e. radially extending stop means on one end of one of said spaced-apart legs;
f. a locking sleeve extendible over said legs on said flat end and engagable with said stop means; and
g. a connector for said elongated strip for holding said sleeve in engagement with said stop means, said connector including means for extending between the end of said strip and said body portion of said securing device.

4,068,356

TENTER GUIDE RAIL GAP CROSSING MECHANISM

Henry Parrillo, Johnston; John Sherman Harrington, Warwick, and Glenn Howard Curtis, North Kingstown, all of R.I., assignors to Marshall and Williams Company, Providence, R.I.

Division of Ser. No. 524,550, Nov. 18, 1974. This application July 8, 1976, Ser. No. 703,577
Int. Cl.² D06C *3/04*
U.S. Cl. 26—91 **2 Claims**



1. Apparatus for stretching web material by use of tentering clips and providing a uniform distribution of transverse stretching forces comprising a frame, a plurality of cross members secured to said frame, a plurality of bearings fastened to each cross member, a plurality of shafts, one for each cross member, each shaft having a right hand thread and a left hand thread, means rotatably mounting said shafts in said plurality of

bearings, a plurality of saddles, two for each cross member, means slidably mounting said saddles to said cross members, a plurality of nuts, one secured in each saddle, one nut of one saddle of an associated shaft connected to a right hand thread, alternately, another nut of the other saddle of the shaft connected to a left hand thread, whereby rotation of the shaft in one direction draws the saddles toward each other and rotation of the shaft in an opposite direction separates said saddles, a pluralitv of blocks, one for each saddle, means slidably mounting a block in each saddle, a plurality of pivot pins, one fastened in each block, a plurality of grooved guide straight rail sections having upper forward straight tenter clip engaging faces and lower rear straight tenter clip engaging faces, pivotally mounted to said saddles, with the end of one rail being pivotally mounted to the end of an adjacent rail through said pivot pins, thereby to provide two pivotally connected adjacent grooved guide straight rail sections with a gap therebetween, each of said plurality of grooved guide straight rail sections having complimentary tapered ledges on opposite ends, said plurality of grooved guide straight rail sections forming two closed loop paths to accommodate, respectively, two closed loop tentering chains, said shafts providing incremental adjustment between pairs of rails controlled by the same shaft and incremental adjustment between adjacent rails, a first means providing a gap crossing mechanism between the ends of adjacent grooved guide straight rail sections at the upper forward tenter clip engaging face, and a second means providing a gap crossing mechanism between the ends of adjacent grooved guide straight rail sections at the lower rear tenter clip engaging face, said first means and said second means yielding on an arc having a radius with a center located in the center of the pivot pin upon relative pivotal movement between adjacent grooved guide straight rail sections, said first means and said second means providing a smooth arcuate connection between respectively, said upper forward tenter clip engaging face and said lower rear tenter clip engaging face, during various degrees of diverging and converging relationship between adjacent grooved guide straight rail sections, the ledge on one rail section complimentary tapered to cooperate with the complimentary taper on the adjacent rail section providing a path without jar for a roller on a tenter clip.

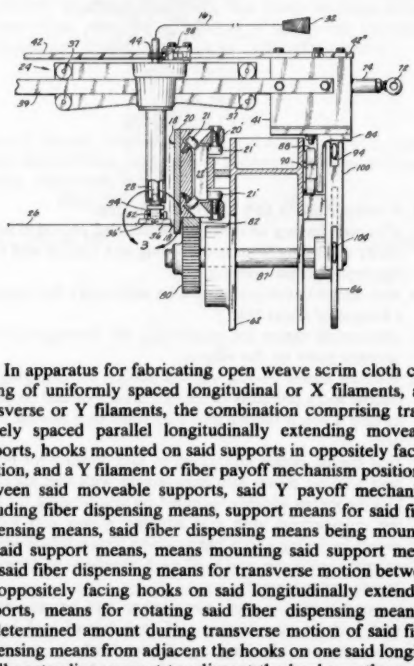
2. Apparatus for stretching web material by use of tentering clips and providing a uniform distribution of transverse stretching forces comprising a frame, a plurality of cross members secured to said frame, a plurality of bearings fastened to each cross member, a plurality of shafts, one for each cross member, each shaft having a right hand thread and a left hand thread, means rotatably mounting said shafts in said plurality of bearings, a plurality of saddles, two for each cross member, means slidably mounting said saddles to said cross members, a plurality of nuts, one secured in each saddle, one nut of one saddle of an associated shaft connected to a right hand thread, alternately, another nut of the other saddle of the shaft connected to a left hand thread, whereby rotation of the shaft in one direction draws the saddles toward each other and rotation of the shaft in an opposite direction separates said saddles, a plurality of blocks, one for each saddle, means slidably mounting a block in each saddle, a plurality of pivot pins, one fastened in each block, a plurality of grooved guide straight rail sections having straight tenter clip engaging faces, pivotally mounted to said saddles, with the end of one rail being pivotally mounted to the end of an adjacent rail through said pivot pins, thereby to provide two pivotally connected adjacent grooved guide straight rail sections with a gap therebetween, said plurality of grooved guide straight rail sections forming two closed loop paths to accommodate, respectively, two closed loop tentering chains, said shafts providing incremental adjustment between pairs of rails controlled by the same shaft and incremental adjustment between adjacent rails, that improvement in which means between the ends of adjacent grooved guide straight rail sections provide a gap crossing mechanism, said means yielding on an arc, having a radius with the center located in the center of the pivot pin, upon relative pivotal movement between adjacent grooved guide straight rail sections, said means providing a smooth arcuate connection between the straight tenter clip engaging faces having various degrees of diverging and converging relationship with respect to one another, said means between the ends of adjacent grooved guide straight rail sections which provide a gap crossing mechanism comprise a coil spring, having a flat tenter clip engaging surface, a front chamber and a rear chamber provided, respectively, in opposite ends of each grooved guide straight rail section, said coil spring located between opposite ends of adjacent grooved guide straight rail sections, with one end located in a front chamber and the other end located in a rear chamber, with said flat tenter clip engaging surface forming an arcuate surface continuation of the straight face tenter clip engaging surfaces of the, respective, adjacent pivotally connected grooved guide straight rail sections, a first dowel pin located within one end of said coil spring, a second dowel pin located within the other end of said coil spring, set screw means rotatably secured in the opposite ends of said adjacent pivotally connected grooved guide straight rail sections, engaging, respectively, opposite ends of said coil spring at the, respective, dowel pin, and a tapered dowel pin located within the medial area of the coil spring at the gap between the ends of adjacent grooved guide straight rail sections, whereby said tapered dowel pin supports said coil spring at said gap while permitting said coil spring to bend in an arc having a radius scribed from the center of said pivot pin.

4,068,357

METHOD AND APPARATUS FOR FABRICATING OPEN WEAVE SCRIM CLOTH

William B. Goldsworthy, Palos Verdes, Calif., and Harald E. Karlson, Eugene, Oreg., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 27, 1976, Ser. No. 754,491
Int. Cl.[2] D04H *3/04*
U.S. Cl. 28—101 **33 Claims**



1. In apparatus for fabricating open weave scrim cloth consisting of uniformly spaced longitudinal or X filaments, and transverse or Y filaments, the combination comprising transversely spaced parallel longitudinally extending moveable supports, hooks mounted on said supports in oppositely facing relation, and a Y filament or fiber payoff mechanism positioned between said moveable supports, said Y payoff mechanism including fiber dispensing means, support means for said fiber dispensing means, said fiber dispensing means being mounted on said support means, means mounting said support means and said fiber dispensing means for transverse motion between the oppositely facing hooks on said longitudinally extending supports, means for rotating said fiber dispensing means a predetermined amount during transverse motion of said fiber dispensing means from adjacent the hooks on one said longitudinally extending support to adjacent the hooks on the opposite said longitudinally extending support, and fiber support means carried on said fiber dispensing means, to receive a fiber

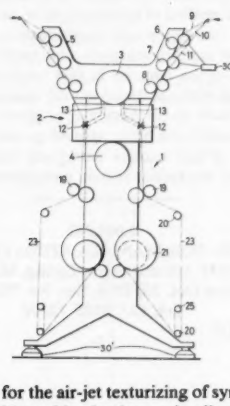
from said fiber dispensing means during rotation and transverse motion thereof between said longitudinally extending supports, and to snap said filament over a hook or hooks on one of said longitudinally extending supports when said fiber dispensing means and said fiber support means are disposed adjacent the hooks on said one of said longitudinally extending supports.

4,068,358

MACHINE FOR AIR-JET TEXTURIZING OF CONTINUOUS SYNTHETIC FILAMENTS

Gerhard Luther, Berlin, Germany, assignor to Berliner Maschinenbau-AG vormals L. Schwartzkopff, Germany

Filed June 16, 1976, Ser. No. 696,506
Claims priority, application Germany, June 18, 1975, 2527511
Int. Cl.² D02G *1/16*
U.S. Cl. 28—272 **8 Claims**



1. In a machine for the air-jet texturizing of synthetic continuous filaments, said machine having a plurality of texturizing nozzles which are connected to compressed air; the texturizing nozzles having channels directed in a vertical direction;

supply mechanisms for guiding at least two synthetic continuous filaments to each nozzle, said supply mechanism being located with their axes parallel to the longitudinal plane of said machine;

an improvement comprising at least two supply mechanisms for each nozzle, each supply mechanism supplying a continuous filament, said supply mechanism being located in a common plane directed at an acute angle with respect to the longitudinal middle plane of the machine, said supply mechanisms being offset with respect to each other in their plane in the longitudinal direction of the machine;

a vessel which is filled with compressed air, said vessel extending over the entire length of said machine, said vessel serving to supply said texturizing nozzle; and

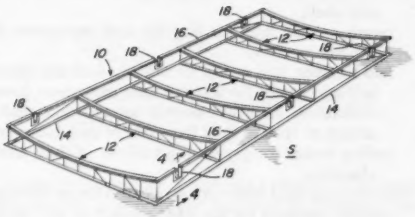
a nozzle box attached to the vessel, said nozzle box containing said texturizing nozzles which are located on both sides of said vessel, said texturizing nozzles being located in the plane which is formed by said supply mechanisms, said vessel supplying the texturizing nozzles from at least one branch; said nozzle box having a plurality of openings corresponding to the number of said filaments for guiding said filaments toward said nozzles to prevent their coming into contact with each other prior to entry into said jet nozzle channels.

4,068,359

TANK FABRICATION APPARATUS

Jack E. Bunker, 108 E. Ash, Winfield, Iowa 52659

Division of Ser. No. 461,456, April 16, 1974, Pat. No. 3,935,633. This application Nov. 7, 1975, Ser. No. 629,977
Int. Cl.² B23Q *7/00*
U.S. Cl. 29—33 K **4 Claims**



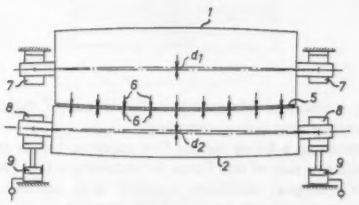
1. Apparatus for shaping sheet material for use in constructing containers in which the sheet of material has a weight sufficient to bend the sheet, comprising jig means provided with a concavity for supporting the sheet for conforming the sheet to the concavity by the force present due to the weight of the sheet, said jig means including a plurality of longitudinally spaced, transversely extending girders having concave upper edges, longitudinal stringers rigidly interconnecting said girders, said stringers including recesses therein spaced from the girders, transversely extending shapers received and supported in said recesses, each of said shapers having an arcuate upper edge conforming with the upper edges of the girders for engaging the sheet, and means for securing the shapers to the sheet for maintaining the arcuate configuration thereof when the sheet along with the shapers are removed from the jig means.

4,068,360

PRESS ROLL WITH BENDING CONTROL DEVICE

Fred H. Freuler, Bannlistrasse, Riedholz, Switzerland

Filed Oct. 20, 1976, Ser. No. 734,045
Claims priority, application Switzerland, Oct. 24, 1975, 13820/75
Int. Cl.² B21B *13/02*
U.S. Cl. 29—116 AD **13 Claims**



1. A press roll having bending control apparatus comprising

a substantially cylindrical roll shell having an outer surface for receiving pressing forces and an inner surface;

a supporting shaft extending through and rotatable with said shell;

means outside of said shell for rotatably supporting said shaft;

a plurality of supporting devices longitudinally arranged on said shaft for exerting outward forces on said shell relative to said shaft in opposition to said pressing forces;

a source of fluid under pressure;

means in said shaft defining a plurality of ducts for supplying fluid under pressure from said source to said supporting devices,

each of said supporting devices comprising

an elastically compressible and flexible annular member radially movable relative to said shell and said shaft,

means on said shaft for limiting the radial outward movement of said annular member to a position in which the maximum outward expansion of said member relative to the axis of said shaft is a position in which the distance between the axis of said shaft and the outer surface of said member is substantially equal to the inner radius of said shell,

means on said shaft for limiting axial movement of said annular member,

said member, said means for limiting outward movement and said means for limiting axial movement forming a continuous annular chamber around said shaft connected to receive fluid from one of said ducts, and

sealing means for preventing outflow of fluid from said chamber,

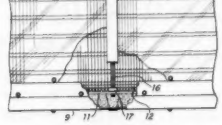
whereby said fluid under pressure exerts forces through said annular members on the inner surface of said shell such that the orientation of the resultant forces produced by each of said supporting devices remains unchanged as said shell rotates.

4,068,361

SELF-JIGGING METHOD OF FABRICATING SOLAR COLLECTOR HEAT TRAP FROM FLEXIBLE PLASTIC ROLL MATERIAL

Ernest F. Root, Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 26, 1976, Ser. No. 652,023
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.3 R **8 Claims**



1. A method of fabricating wall portions of the cells of a solar energy heat trap comprising:

a. providing a frame having first receptor means associated with one side of said frame for receiving a first plurality of wall support members together with second receptor means associated with the opposite side of said frame for receiving a second plurality of wall support members;

b. wrapping a continuous strip of thin, flexible light transmissive wall material about a first wall support member of said first plurality of wall support members and thereafter inserting said first wall support member into said first receptor means, thereafter wrapping said material about a wall support member of said second plurality of wall support members, thereafter inserting said wall support member of said second plurality of wall support members into said second receptor means, thereafter wrapping said material about a second wall support member of said first plurality of wall support members, thereafter inserting said second wall support member into said first receptor means, and so forth to produce zig-zagged wall portions of the cells of said solar energy heat trap;

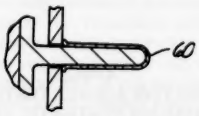
c. inducing tension within said flexible light transmissive wall material after each of the wrapping steps of paragraph (b), thereby to prevent drooping of said material.

4,068,362

METHOD OF FORMING RINGS

Edward G. Spisak, 35700 Oakwood Lane, Westland, Mich. 48185

Continuation-in-part of Ser. No. 639,397, Dec. 10, 1975. This application Oct. 20, 1976, Ser. No. 734,235
Int. Cl.² B21D *53/26*
U.S. Cl. 29—159 A **9 Claims**



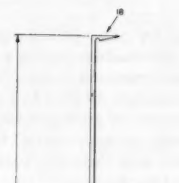
1. The method of forming an annular ring having a generally U-shaped cross section from an endless, circular workpiece in which the material extends axially comprising; positioning a cylindrical workpiece relative to forming apparatus capable of exerting a force radially outwardly in all directions on an inner circumferential portion of said workpiece, actuating said forming apparatus to engage said workpiece to exert said force between spaced annular marginal edge portions of said workpiece to displace the material in said workpiece radially outwardly until all of the material in said marginal edge portions is disposed radially to form annular portions disposed parallel to each other, said force being applied on said inner circumferential portion of said endless workpiece while all remaining surfaces of said workpiece remain unsupported.

4,068,363

HAND TOOL FOR MANIPULATING COIL SPRINGS

John Costa, 13601 Athania, Silver Spring, Md. 20906

Filed Oct. 26, 1976, Ser. No. 735,269
Int. Cl.² B23P *19/04*
U.S. Cl. 29—227 **4 Claims**



1. A hand tool useful for the assembly and disassembly of a coil spring securing a sealed beam headlight within an automotive headlight assembly wherein the space between said sealed beam and a wall of said assembly is at least approximately 0.125 inches, said tool comprising:

a handle;

shank means secured at one end thereof to said handle;

elongated hook means integrally secured to the other end of said shank means and disposed perpendicular to the longitudinal axis of said shank means so as to form therewith a substantially L-shaped member,

said shank means having a thickness of about 3/32 inch in the vicinity of said hook means and said hook means having a length of about 9/16 to 13/16 inch and a thickness of about 3/32 inch, said dimensions permitting the insertion of said hook means and said other end portion of said shank means between the central coils of a coil spring and within the interior of said spring, said dimensions permitting the manipulation and rotation of said shank means within said coil spring and insertion between a sealed headlight and a wall of said assembly which is about 0.125 inch wide; and

said hooked means further comprising inclined surface portion means for facilitating said insertion of said hooked portion between said spring coils and within the interior portion of said spring and recess means defined between said inclined portion of said hook and said shank member for receiving one of said coils of said spring upon insertion of said hook portion into the interior of said spring.

4,068,364

RESLEEVING TOOL

Gordon H. Tharp, 8910 Sunset Drive, Wonder Lake, Ill. 60097, and Herman Dorland, 2850-F W. Touhy, Chicago, Ill. 60645

Filed Jan. 15, 1976, Ser. No. 649,506
Int. Cl.² B23P *19/02*
U.S. Cl. 29—235 **7 Claims**

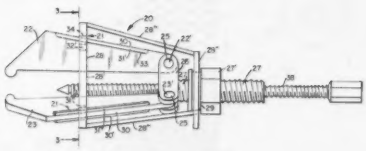
1. A two-piece tool for applying an elastic sleeve to a shaft which consists of a pair of separate, unconnected, elongated, channel-shaped members adapted, when placed together, long edges to long edges, to rock with respect to each other on a transverse axis intermediate their length to juxtapose ends of said members at one extreme of said rocking movement, said ends when juxtaposed being proportioned to be insertable into said sleeve, and to define an open tube proportioned to encompass said shaft and to stretch said end of said sleeve to permit the placement thereof about one end of said shaft at another point in said rocking movement, said members including an interengaged notch and protruding bearing on said long edges at each side at said rocking axis when placed together to prevent longitudinal relative displacement as between said members, said bearings being flush with the inside surface of said defined tube, and brackets on one of said members extending from the long edges thereof at said rocking axis spaced to embrace the other of said members to prevent relative lateral displacement from said edges-to-edges relationship.

4,068,365

LOCKING PULLER DEVICE

Paul W. Brandt, and Dean S. Somerville, Box 215, both of McHenry, N. Dak. 58464

Filed Feb. 14, 1977, Ser. No. 768,338
Int. Cl.² B23P *19/04*
U.S. Cl. 29—261 **3 Claims**



1. A locking puller device comprising a plurality of pivotally mounted arm-like jaws pivotably mounted to a collar at their rearward ends, a sleeve fixed to said collar and projecting rearwardly, a threaded nut means threaded onto said sleeve, a cam ring forward of the collar surrounding the jaws, braces fixed to the cam ring and extending rearwardly, a ring rotatably mounted to the nut means, said braces having their rearward ends fixed to the ring, projecting lug means mounted to and supported only by the cam ring and projecting from the cam ring radially inward about the outer edge surfaces of the jaws, said jaws having under surfaces, said lug means projecting beneath the under surfaces of the jaws, said jaws having its outer and under surfaces tapered relative to the direction of the cam ring movement, to cause the jaws to move toward one another by engagement with the cam ring on the outer surfaces as the cam ring moves forward or spread apart by the engagement with the cam ring lug means on the under surfaces as the cam ring moves rearward, said cam ring is movable forward by the rotation of the nut means in one direction, with the nut means engaging against the ring to move the ring and as the ring moves, the brace moves thereby moving the ring forward and the cam ring engages the tapered outer surfaces of the jaws to cam the jaws toward one another, and by rotation of the nut means in the opposite direction the nut means engages against the ring which moves the ring which moves the brace which moves the cam ring and projecting lugs rearward, and the projecting lug means engages the under surfaces of the jaws to cam the jaws apart.

4,068,366

METHOD AND APPARATUS FOR PRODUCING OPENINGS IN SHEET MATERIAL

Hans Hillesheim, Heinrich Luttig Strasse 2, 6781 Hohfroschen, Germany

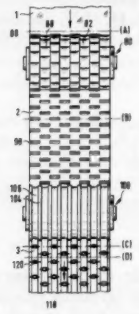
Filed Nov. 1, 1976, Ser. No. 737,282
Claims priority, application Germany, Nov. 3, 1975, 2549072
Int. Cl.² B21D *31/04*
U.S. Cl. 29—527.4 **20 Claims**

1. A process for producing openings in sheet material, said openings being aligned in a longitudinal direction of said material, comprising the steps of:

deforming the sheet material to provide notches therein arranged in rows extending in said longitudinal direction; and

reducing the thickness of partial areas of the notched sheet material between said rows, said partial areas including

the ends of the notches, thus enlarging the notches which lie between the reduced thickness partial areas of the



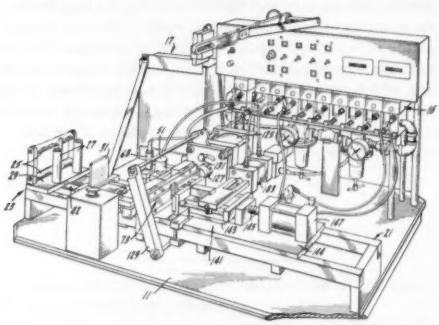
notched sheet material to form openings extending between the major surfaces of said sheet material.

4,068,367

TERMINAL FORMING AND INSTALLING APPARATUS

Maurice H. Brown, 11655 S. Mayfield, Worth, Ill. 60482

Filed Nov. 3, 1976, Ser. No. 738,639
Int. Cl.² B23P *23/00*
U.S. Cl. 29—564.6 **15 Claims**



6. An apparatus for simultaneously forming a plurality of terminals from a plurality of lengths of wire and inserting the terminals simultaneously into openings preformed in a plastic part, said apparatus including:

means for simultaneously moving a plurality of lengths of wire held in spaced relation to one another in more than one plane to a severing position,

means for simultaneously severing end portions from said lengths of wire at said severing position to form a plurality of terminals,

means for supporting said terminals in spaced relation to one another,

means for supporting a plastic part having openings formed therein for receiving said terminals; and

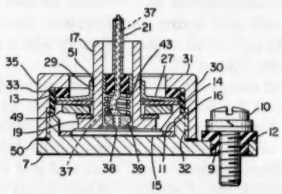
means for moving said plastic part and said terminals into engagement with one another to embed said terminals in said openings in said plastic part.

4,068,368

CLOSURE FOR SEMICONDUCTOR DEVICE AND METHOD OF CONSTRUCTION

James Edward DeBard, Eatontown; Raymond Walter Borden, Farmingdale, and John Joseph Tumpey, Oakhurst, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Division of Ser. No. 621,917, Oct. 14, 1975, abandoned. This application Aug. 9, 1976, Ser. No. 713,071
Int. Cl.² B01J *17/00*
U.S. Cl. 29—588 **4 Claims**



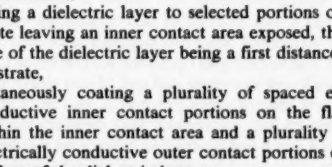
1. A method of assembling a semiconductor device comprising securing a diaphragm with an aperture therein by means of insulation to a ring-shaped electrode having a threaded skirt depending therefrom, assembling a spring member on a cylindrical electrode having a flange at one end and inserting the cylindrical electrode through the aperture in the diaphragm with the spring member being positioned between the flange and the diaphragm, positioning a semiconductor pellet on a base having a threaded flange, positioning the flange of the cylindrical electrode on the semiconductor pellet, and screwing the threaded skirt onto the threaded flange on the base to a predetermined torque to compress the spring member and exert a predetermined pressure on the pellet, and securing the diaphragm to the cylindrical electrode.

4,068,369

METHOD OF MAKING PUSHBUTTON KEYBOARD SYSTEM

Perry W. Kaminski, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 535,468, Jan. 10, 1975, Pat. No. 3,996,427. This application Aug. 20, 1976, Ser. No. 716,034
Int. Cl.² H01H *13/26*
U.S. Cl. 29—622 **13 Claims**



1. A method of making low profile keyboard switches comprising the steps of providing a substrate having a first relatively flat surface,

applying a dielectric layer to selected portions of the substrate leaving an inner contact area exposed, the top surface of the dielectric layer being a first distance from the substrate,

simultaneously coating a plurality of spaced electrically conductive inner contact portions on the flat surface within the inner contact area and a plurality of spaced electrically conductive outer contact portions on the top surface of the dielectric layer,

an outer contact portion disposed adjacent each inner contact portion, the top surface of the outer contact portion being spaced from the substrate a distance greater than the top surface of the inner contact portion,

placing a switch actuating element on each outer contact portion, and

disposing retaining means over the substrate to maintain the actuating elements in position relative to their respective contact portion.

4,068,370
MOUNTING MEANS FOR A CIRCUIT BREAKER AND METHOD OF MAKING THE SAME

Svein T. Nordberg, and Donald R. Shaner, both of El Paso, Tex., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 669,999, March 24, 1976. This application Apr. 14, 1977, Ser. No. 787,430
Int. Cl.² H01H *69/00*
U.S. Cl. 29—628 **2 Claims**

1. A method of forming a mount for mounting a circuit breaker having an envelope with a pair of electrical conductors extending from a base of said envelope in a holder having an electrically insulative body with a conductive first contact carried by the base of said body and a conductive first retaining means carried by said body comprising the steps of:

bonding a conductive second retaining means to said envelope in a position circumscribing at least a portion of said envelope for engaging said first retaining means to retain said circuit breaker in said holder;

attaching one of said pair of electrical conductors to said second retaining means for forming an electrical connection therebetween;

attaching a conductive second contact to the other one of said pair of electrical conductors; and

molding electrically insulative spacing material between said base of said envelope and said second contact for spacing said second retaining means from said second contact a predetermined distance, said spacing material encompassing said pair of conductors for holding said conductors in a spaced relationship, said predetermined distance ensuring contact between said first and second contacts when said first and second retaining means are engaged.

4,068,371
METHOD FOR COMPLETING WIRE BONDS

Charles Fredrick Miller, 2165 N. Glassell, Orange, Calif. 92667

Filed July 12, 1976, Ser. No. 704,319
Int. Cl.² H01R *43/02*
U.S. Cl. 29—628 **4 Claims**

1. The method of making wire connections between circuit points on the surface of a miniature assembly of electronic elements through the medium of a bonding tool of the kind that includes an opening through which the bonding wire is threaded, which method comprises the steps of:

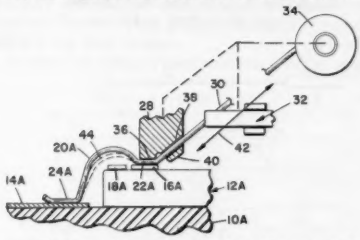
arranging a length of wire such that it extends through the passage in the bonding tool with sufficient freedom to permit relative movement between the standing part of the wire and the tool in either direction through the passageway;

bonding an end of said wire to a first circuit point using said tool;

lifting the tool from the first bond point in a generally vertical direction while permitting the standing part of the wire to be payed out by being pulled through the tool;

moving the tool laterally to a position directly over the second point;

clamping said wire against movement through said passageway throughout the motion of said tool from said position



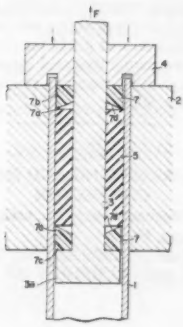
over the second circuit point to said second circuit point; and

lowering the tool to the second point such that the wire underlies the tool on said second circuit point while preventing movement of the wire in either direction through said passageway.

4,068,372
TUBE EXPANDER

Hideaki Kamohara, Kudamatsu; Toji Nakatui, Hikari; Yuji Yoshitomi, Kudamatsu; Iwao Sasaki, Kudamatsu, and Kenji Shimada, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,198
Claims priority, application Japan, Feb. 18, 1976, 51-15879
Int. Cl.² B23P *17/00*
U.S. Cl. 29—727 **10 Claims**

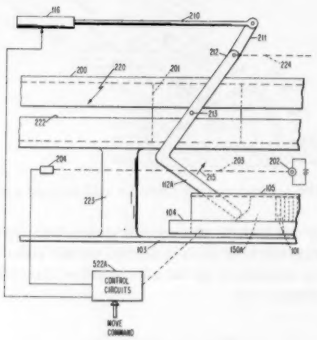


1. A tube expander having a tubular, elastic expansion medium having axially opposite end surfaces and adapted to be inserted into a tube which, through a radial expansion thereof, is adapted to be fixed to a tube plate; a pressurizing rod passing through said expansion medium; a pressurizing rod head provided at one end of said pressurizing rod; a back-up ring adapted to be supported by an end of said tube plate straddling a tube-receiving bore of said tube plate, said back-up ring being telescopically received by said pressurizing rod; and seal rings each disposed to abut respective ones of said end surfaces of said expansion medium, said seal rings being of an elastic material having a hardness greater than that of said expansion medium and telescopically received by said pressurizing rod, and at least one of said seal rings having a conical recess at its portion confronting the end surface of said expansion medium.

4,068,373
COMPONENT INSERTION MACHINE

Terry Lee Bell; Lyle G. Call, both of Boulder; George Omer Dillan, Longmont; James Phillip Jackson, Jr., Longmont, and Larry Albin Johnson, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,496
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—741 **5 Claims**



1. Apparatus for inserting different size circuit modules into a circuit board, each of said circuit modules having two or more leads emerging from a first side thereof, said modules to be inserted into a circuit board;

a number of positionable module-containing magazines, each of said magazines containing a stack of essentially identically dimensioned modules positioned with their leads parallel with each other;

a table supporting said magazines and being movable transverse to direction of module feed within said magazines;

the improvement including in combination:

a loading driver having an upper actuating end and a lower pushing end;

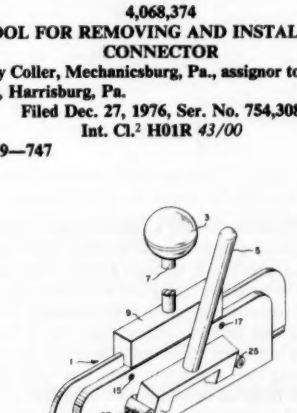
a friction block guide extending parallel to the direction of module feed and disposed above said movable table;

a friction slide block in said guide for pivotably supporting said loading driver such that said loading driver is pivotable between a module engaging position and a retracted noninterferring position.

4,068,374
TOOL FOR REMOVING AND INSTALLING CONNECTOR

James Ray Coller, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 27, 1976, Ser. No. 754,308
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—747 **11 Claims**



1. A tool for removing and installing a connector housing within which is disposed a row of elongated resilient connector pairs, wherein each of the connectors of a pair is anchored at one end in a circuit board and is provided with closely spaced confronting contact portions distal from the board, said connectors abutting an adjacent wall of the housing at a location spaced from the contact portions,

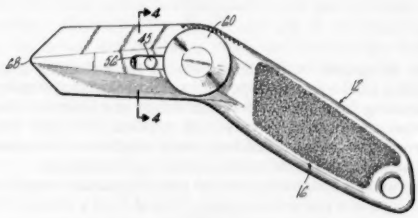
said tool comprising wedge means including a wall member terminating at one end in a wedge tip for insertion between the contact portions of the connectors and a handle member at the opposite end, a pair of gripping elements mounted on one of said members for movement to engage the opposite walls of the housing between them while the wedge tip extends between the contact portions to remove said housing from the connectors while rocking it relative thereto, and

camming means movably mounted on said tool for moving said gripping elements to engage said walls of the housing.

4,068,375
HEAVY DUTY RETRACTABLE BLADE UTILITY KNIFE

Richard H. Rathbun, Oakdale, and Robert F. West, Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 8, 1976, Ser. No. 748,510
Int. Cl.[2] B26B *5/00*
U.S. Cl. 30—125 **4 Claims**



1. A retractable blade utility knife having a blade receiving opening through one end thereof and comprising a pair of elongated mating handle halves separable along a plane generally extending longitudinally of the knife, a blade carrier having a base for supporting a blade thereon, said blade carrier being mounted between the handle halves for reciprocable movement toward and away from the blade receiving opening to shift a blade mounted thereon between an exposed and sheathed position, one of said handle halves providing a pair of spaced longitudinally extending lands defining a first longitudinal slot, the other of said handle halves defining a mating second longitudinal slot, a blade carrier having a finger piece and a carrier base with an offset extension connected to the carrier base by a necked portion, said necked portion being positioned in said first longitudinal slot with said extension and said base of the blade carrier being disposed on opposite sides of said lands to straddle the same, said finger piece being exposed through said second longitudinal slot and secured to the other of said handle halves for reciprocable movement therein, said finger piece further being secured to said extension thereby to secure the handle halves in assembled relation.

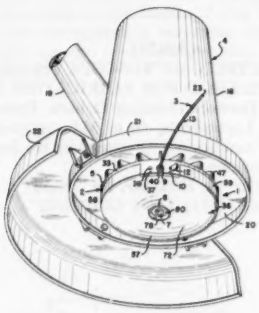
4,068,376
FLEXIBLE CUTTING LINE AND ROTOR THEREFOR

Jack Briar, Gardner, Kans., assignor to Allied Industries of Kansas, Inc., Gardner, Kans.

Filed Oct. 26, 1976, Ser. No. 735,834
Int. Cl.[2] B26B *27/00*
U.S. Cl. 30—276 **10 Claims**

10. In combination, a rotor and a cutting line for a flexible-line lawn trimmer having a drive shaft, said combination comprising:

a. a body having a peripheral portion and an axial central portion;
b. means for connecting the central portion of said body with the drive shaft of said lawn trimmer whereby said rotor body is bodily rotated;
c. an entry opening and an exit opening; said exit opening being positioned generally radially through the peripheral portion of said body;
d. means communicatively joining said entry and exit openings with an angular relationship therebetween;
e. a flexible cutting line threaded through said entry and exit openings and having an enlarged end and a free end; said enlarged end being adjacent to and outwardly of said entry opening, abuttingly engaging said body, and separably anchoring said flexible cutting line in said body; said



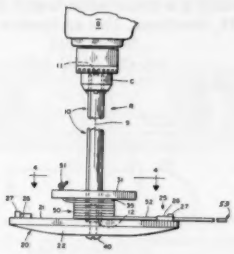
free end extending outwardly of said exit opening and being of suitable length for cutting vegetation in response to rotor rotation;
f. said entry and exit openings are positioned apart and at an angular relationship;
g. said means communicatively joining said entry and exit openings comprises an elongate passageway within said body, said elongate passageway having an entry portion and an exit portion extending into said body from the entry and exit openings respectively and a curved portion connecting said entry portion and exit portion of said elongate passageway and permitting a cutting line free end to be inserted into said entry opening and move through said elongate passageway and out the exit opening to extend therefrom with the enlarged end abutting said body at the inlet opening.

4,068,377
ROTARY CUTTING ASSEMBLY

Richard L. Kimmel, 1402 Lawrence Lane; Walter B. Kamp, 206 Bellevue Blvd. South, both of Bellevue, Nebr. 68005, and Alvin L. P. Aasgaard, III, 3623 Armbrust, Omaha, Nebr. 68124

Filed Aug. 9, 1976, Ser. No. 712,507
Int. Cl.[2] B26B *27/00*; A01D *55/18*
U.S. Cl. 30—276 **13 Claims**

1. Rotary cutting assembly for cutting vegetation with whirling filament and comprising:
A. An elongate lineal shaft extending along a vertical-axis, the longitudinally extending shaft having a bottom-end and also a top-end for removable insertion into a portable manually-held chuck whereby the shaft is powerably rotatable about its vertical-axis;
B. A disc-like base-plate co-rotatably associated with the shaft and located at the shaft bottom-end, said base-plate including a peripheral-edge lying within a horizontal plane and with the shaft at the substantial geometric center of said base-plate, the base-plate including a pair of transversely extending surfaces including a lower-surface and an upper-surface;
C. A convolute supply of filament surrounding the shaft vertical-axis and located immediately adjacent a transverse surface of the base-plate, successive leadward portions of said filament supply being horizontally drawable radially outwardly from the vertical-axis and outwardly beyond the base-plate peripheral-edge for cutting vegetation as the shaft rotates;
D. At least one retainer means attached to the base-plate for

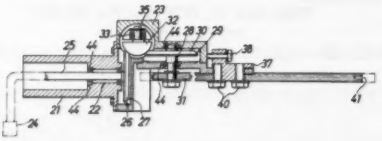


removably securing a leadward filament portion to the base-plate, the said at least one retainer being located nearer the base-plate peripheral-edge than to the longitudinal vertical-axis;
E. Axial confinement means for maintaining the stored convolute filament longitudinally confined with respect to the base-plate; and
F. Gravimetric balancing means to ensure that the center-of-mass for the combination of base-plate, retainer means, and axial confinement means is located substantially at the shaft vertical-axis.

4,068,378
PORTABLE CHAIN SAW

Tashiro Arai; Masaaki Sato, and Eiji Kobayashi, all of Tokyo, Japan, assignors to Nippon Kuatsu System Co., Ltd., Tokyo, Japan

Filed June 23, 1976, Ser. No. 699,136
Claims priority, application Japan, June 26, 1975, 50-88751[U]; Nov. 28, 1975, 50-160092[U]; Dec. 5, 1975, 50-162857[U]
Int. Cl.[2] B27B *17/10*
U.S. Cl. 30—382 **9 Claims**



1. A portable chain saw comprising a chain saw body, a power driven flexible shaft extending to said chain saw body, a chain saw cutter mounted on said chain saw body, and an overload protection means on said chain saw body interposed between said flexible shaft and said chain saw cutter such that the chain saw cutter is driven by said flexible shaft through said overload protection means, said overload protection means comprising a rotatable spherical member and a friction wheel operable to engage said rotatable spherical member, mounting means providing relative movement between said spherical member and said friction wheel, and biasing means urging said spherical member and friction wheel toward one another such that during normal load conditions power is transmitted through the frictional engagement between the spherical member and the friction wheel and upon encountering overload

conditions, slippage occurs between the spherical member and the friction wheel to interrupt the power transmission.

4,068,379

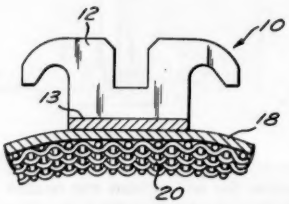
ORTHODONTIC APPLIANCE WITH POROUS TOOTH-ABUTTING FACE

Frank R. Miller, Azusa; Craig A. Andreiko, Pasadena, and Kenneth W. Premo, Fullerton, all of Calif., assignors to Ormco Corporation, Glendora, Calif.

Continuation-in-part of Ser. No. 779,056, March 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 677,412, April 15, 1976, abandoned. This application June 1, 1977, Ser. No. 802,011

Int. Cl.[2] A61C *7/00*

U.S. Cl. 32—14 A **16 Claims**



1. Apparatus for use in the practice of orthodontics by being fixed to a tooth by means of an adhesive comprising:

a base having

a. a first portion which is a mesh with cross-members which are bonded together at each point of intersection therebetween, said first portion having an outer tooth-contour conforming face and an inner face and

b. a second non-porous portion co-extensive with the said first portion; said first portion terminating in said second portion at the inner face of the mesh by a bond therebetween opposite each cross-member bond; and

an orthodontic appliance extending outwardly from the second portion remote from said first portion, whereby said adhesive enters the mesh-like tooth-abutting surface portion but does not pass through the base to reach the orthodontic appliance.

4,068,380

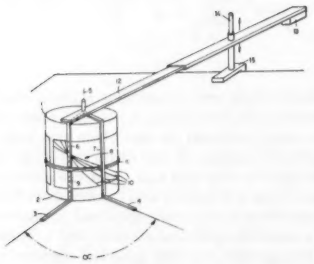
DEVICE FOR DIVIDING AN ANGLE

Willem van Spijker, Valeriusstraat 181 boven, Amsterdam, Netherlands

Filed June 24, 1975, Ser. No. 589,851

Int. Cl.[2] G01B *3/56*

U.S. Cl. 33—1 AP **6 Claims**



1. A device for dividing an angle into equal parts or into parts with a certain proportion with respect to each other comprising

a solid geometric figure having a surface,

an axis of said solid geometric figure perpendicular to the plane in which the angle to be divided is lying and adjustable to pass through the vertex of the angle to be divided,

a zero line, and additional lines corresponding to the number of angles into which the angle is to be divided described on said surface of said solid geometric figure with all of said additional lines passing through one point on said zero line,

a first radial means positioned at said zero line and adjustable for placement at one of the legs of the angle to be divided,

a rotating adjustable means to rotate around said axis to follow a said additional line,

said rotating adjustable means including an adjustable element extending in a plane perpendicular to said axis and slidable over said surface and thereby crossing said additional lines at points to designate placements of said rotating adjustable means to divide the angle into equal or proportional parts.

4,068,381

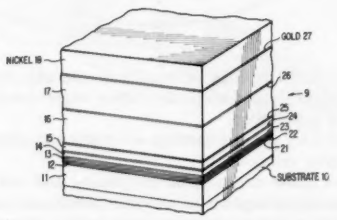
SCANNING ELECTRON MICROSCOPE MICROMETER SCALE AND METHOD FOR FABRICATING SAME

David B. Ballard, Derwood; Fielding Ogburn, Rockville, and John P. Young, Laytonsville, all of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 736,987

Int. Cl.[2] H01J *37/26;* **G01B** *3/02*

U.S. Cl. 33—1 R **5 Claims**



1. A scanning electron microscope micrometer scale comprising:

a substantially nonmagnetic, corrosion resistant substrate;

a microscopically thin multilayer composite deposited on the substrate, said composite formed of a plurality of straight parallel layers of one substantially nonmagnetic, corrosion resistant metal interleaved with a plurality of straight parallel layers of another substantially nonmagnetic corrosion resistant metal, said two metals being of substantially different electron emission coefficients;

the layers of the one of said two metals having a uniform thickness of about 40–80 nm;

the layers of the other of said two metals having thicknesses ranging from about 1 μm near said substrate to many μm away from said substrate;

a cross sectional edge of said composite being ground and metallographically polished; and

a microscopic indentation placed in said substrate adjacent said deposited layers to define a reference region.

4,068,382

ANGLE TANGENT MICROMETER

Joseph E. Jankowiak, 2910 Culver Road, Rochester, N.Y. 14622

Filed Mar. 3, 1977, Ser. No. 773,928

Int. Cl.[2] B43L *7/00, 13/00*

U.S. Cl. 33—75 R **2 Claims**

1. A device

for converting between angular values and the corresponding tangential values, comprising

a protractor,

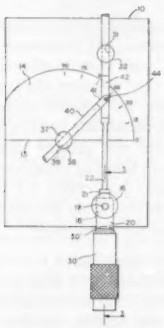
means mounting a cylindrical micrometer housing adjacent said protractor, said housing having on a portion of its outer peripheral surface a set of axially spaced graduations,

a reciprocable shaft projecting slidably from one end of said housing and extending over, and parallel to, a portion of at least one quadrant of said protractor,

said housing having a sleeve rotatably mounted thereon and operatively connected to said shaft to shift said shaft selectively in and out of said one end of said housing,

a pin carried by said shaft and having a pointed end overlying said protractor for movement by said shaft between a first limit position in which the pointed end of said pin registers with a line on said protractor corresponding to a zero angle on the protractor, and a second limit position in which said pointed end registers with a line denoting an angle of 45° on the protractor,

said graduations on said housing being calibrated to represent the corresponding tangential values of the angles included on the protractor between said zero and 45° designations,



said sleeve being mounted to reciprocate axially on said housing, when rotated in opposite directions thereon,

said sleeve being in one of its limit positions when the pointed end of said pin registers with the zero angle on said protractor, and is in the other of its limit positions when said pointed end registers with the 45° angle on said protractor,

one end of said sleeve registering with a graduation denoted as zero on said housing, when the sleeve is in said one, position, and registering with a graduation denoted as "1" on said housing, when said sleeve is in its other limit position,

a rod having a bifurcated end pivotally connected to said shaft by said pin, and

means supporting said rod intermediate its ends for pivotal movement about the center point of said protractor, and for sliding movement at right angles to axis of its pivotal movement, whereby when said shaft is reciprocated the angular position of said rod about said center point will have its corresponding tangential value represented by the graduation on said housing then in registry with said one end of said sleeve.

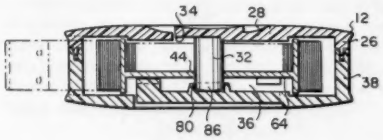
4,068,383

TAPE MEASURE REEL

Klaus Krebs, Neuenhain, Germany, assignor to Hoechstmass Balzer GmbH & Co., Frankfurt am Main, Germany

Filed Sept. 30, 1976, Ser. No. 728,131
Claims priority, application Germany, Oct. 9, 1975, 2545203
Int. Cl.² G01B *3/10*
U.S. Cl. 33—138 **9 Claims**

1. A tape measure comprising a hollow casing having first and second superimposed casing sections, said casing sections each including a resilient tongue, said tongue on said first casing section including an axial rod extending transversely of the casing to an end adjacent the tongue on the second casing section, a tape drum rotatably mounted within said casing and having an opening therein through which said rod extends, an elongated flexible tape secured to said drum and being normally wound thereon, and means in said casing operatively engaged with said drum for normally biasing said drum in a rotary direction for winding the tape on the drum, said drum and said tongue on the second casing section including cooperating means for normally holding said drum against rotation



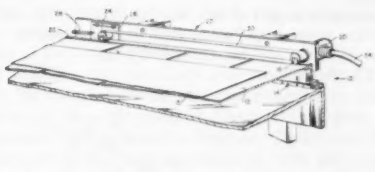
and under the bias of said spring means whereby depression of the tongue on the first casing section towards the second casing section causes said rod to move the tongue on the second casing section away from the drum to disengage said cooperating means whereby the drum is free to rotate under the influence of the spring means to wind the tape thereon; said cooperating means comprising at least one stop on said drum extending therefrom towards said second casing section and a cooperating tooth on said tongue of the second casing section extending towards said drum and normally located in the path of travel of said stop during rotation of the drum.

4,068,384

LINEAR POSITION MEASURING DEVICE

Josef K. Holy, and Alan R. Henderson, both of Carlsbad, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 12, 1976, Ser. No. 741,260
Int. Cl.² G01B *3/12, 5/04, 7/04*
U.S. Cl. 33—141 F **2 Claims**



1. A device for providing output signals indicative of the linear travel of a conveyor, said device comprising:

magnetic strips rigidly fastened along the length of the conveyor;

a support frame;

two pulleys;

a shaft encoder rotary measuring device fixedly mounted to said support frame, said rotary measuring device having an input shaft coupled to one of said pulleys and is adapted for providing output signals indicative of the rotation of said input shaft;

a plate slideably mounted to said support frame and rotatably mounting said other pulley;

an endless steel belt passing around said two pulleys; and

a spring connected between said plate and said frame whereby said belt is tautly maintained;

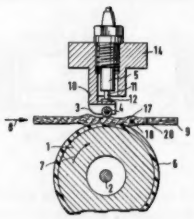
said support frame being disposed relative to said conveyor so that said belt is in contact with said magnetic strips; whereby

the output signals from said rotary measuring device are indicative of the linear travel of the conveyor.

4,068,385
APPARATUS FOR MEASURING THICKNESS DIFFERENCES IN RECORD CARRIERS, SUCH AS BANK NOTES AND THE LIKE

Wilhelm Mitzel, Neukaeferloh, Germany, assignor to G.A.O. Gesellschaft fur Automation und Organisation m.b.H., Germany

Filed July 12, 1976, Ser. No. 704,482
Claims priority, application Austria, July 15, 1975, 5470/75
Int. Cl.[2] G01B 7/06; B07C 5/08
U.S. Cl. 33—143 L 8 Claims

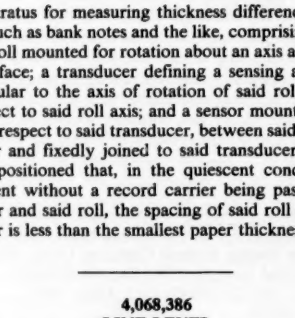


1. Apparatus for measuring thickness differences in record carriers, such as bank notes and the like, comprising, in combination, a roll mounted for rotation about an axis and having an elastic surface; a transducer defining a sensing axis mounted perpendicular to the axis of rotation of said roll and rigidly with respect to said roll axis; and a sensor mounted quasi-rigidly, with respect to said transducer, between said roll and said transducer and fixedly joined to said transducer; said sensor being so positioned that, in the quiescent condition of the arrangement without a record carrier being passed between said sensor and said roll, the spacing of said roll surface from said sensor is less than the smallest paper thickness to be measured.

4,068,386
LINE LEVEL

Walter E. Streeter, 3161 NW. 108th Drive, Coral Springs, Fla. 33065

Continuation-in-part of Ser. No. 713,187, Aug. 10, 1976. This application Feb. 1, 1977, Ser. No. 764,593
Int. Cl.[2] G01C 9/28
U.S. Cl. 33—369 3 Claims



1. A line level consisting of a first half and a second half each having a mating inner surface each said half consisting of a first end portion, an intermediate portion, and a second end portion, said first half and said second half in said intermediate portion having a curved inner surface in the shape of a part of a circular cylinder, said first end portion and said intermediate portion are defined by a first partition, and said second end portion and said intermediate portion are defined by a second partition, a level vial is disposed between said first half and said second half in said intermediate portion, said level vial resting between said first portion and said second partition, and between said curved inner surfaces of the said intermediate portions of said first half and said second half, said first end portion and said second end portion of said first half and said second half having flat outer surfaces on the bottom and outer sides thereof, said first and second portions have an outer surface portion defining a generally rectangular shape, at least one of said halves having an energy director flange formed on the inner surface for ultrasonic welding of said halves together, and a hook formed on one said end of said first half and a stop formed on the other said end of said first half and a hook and a stop formed on the opposite end portions of said second half whereby said line level can be supported on a line between said hooks and said stops, a first viewing port formed in the upper surface of each said half at said intermediate portion and a second viewing port formed in the lower surface of each said half at said intermediate portion.

4,068,387
SOLVENT DRYING OF CELLULOSE ESTER MEMBRANES

Philip Manos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

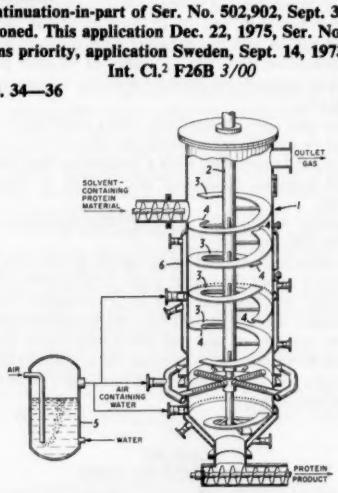
Filed July 6, 1976, Ser. No. 702,449
Int. Cl.[2] F26B 5/00
U.S. Cl. 34—9 9 Claims

1. A process for drying water-wet, semipermeable cellulose ester membrane by contacting the membrane at a temperature of about from 0° to 50° C with volatile solvent having a boiling point below about 175° C to substantially completely remove water from the membrane, the volatile solvent (a) being inert to the membrane and the membrane wetting liquid and having (b) a solubility parameter not greater than about 8.4 cal. ^{1}cc.$^{-3/2}$and (c) a hydrogen bonding component of the solubility parameter not greater than about 2.5 cal. ^{1}cc.$^{-3/2}$; and vaporizing the volatile solvent from the membrane.

4,068,388
PROCESS FOR REMOVING SOLVENT FROM PROTEINACEOUS MATERIAL

Tryggve Lund Knutsen, Asa Station, and Sven-Olof Osterman, Molndal, both of Sweden, assignors to Astra Protein Products AB, Sweden

Continuation-in-part of Ser. No. 502,902, Sept. 3, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,302
Claims priority, application Sweden, Sept. 14, 1973, 7312533
Int. Cl.[2] F26B 3/00
U.S. Cl. 34—36 13 Claims



1. A process for evaporation of solvent from solvent-containing proteinaceous material which comprises continuously treating the protein material in a vertical column with countercurrently flowing humidified air in an amount of from 1.0 to 5.0 m^3 per kg. of treated protein material, the column being indirectly heated to a temperature below the temperature of the humidified air introduced and the humidified air having a

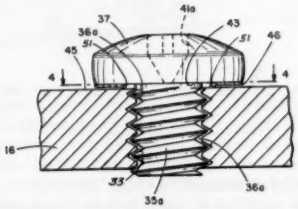
temperature of from 40° C. to 90° C. and and a relative humidity of at least 50% such that enough energy is added for vaporization of the solvent at the same time as water is condensed from the humidified air and replaces the amount of solvent being vaporized.

4,068,389

GAS-DIFFUSION PLATE FOR FLUIDIZED BED APPARATUS

H. Kenneth Staffin, and Robert Staffin, both of Colonia, N.J., assignors to Procedyne Corporation, New Brunswick, N.J.

Filed Apr. 15, 1976, Ser. No. 677,466
Int. Cl.² F26B *17/00*
U.S. Cl. 34—57 A **4 Claims**



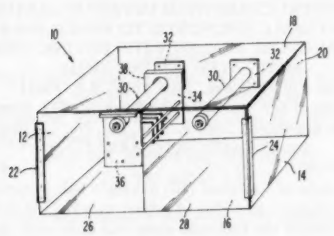
1. A fluidized bed reactor including a diffusion plate, said plate having a plurality of ports therethrough to provide for a plurality of flows of gas through said ports from one side of said plate to the other side thereof, wherein each of said ports comprises a threaded hole, the crests of said threads being truncated, threaded means individual to each of said ports rotatably engaged with a respective one of the threaded holes for axial adjustment within the individual port to define with the respective threaded hole an adjustable helical path for said flow of gas through said plate, the threaded means defining, with the surface of said other side of said plate, passage means to discharge the gaseous flow from each of the ports in a laterally, outwardly-directed path, said threaded means comprises a plurality of machine screws, one individual to each port and each having a head and shank and a lock washer received over the shank, said washer having a plurality of circumferentially spaced resilient tangs to adjustably position and secure said head in spaced relation with the said surface of said other side of said plate to define a plurality of channels beneath said head for gaseous flow in a plurality of radially and outwardly directed, substantially horizontal, gaseous streams across said surface.

4,068,390

PHOTOMASK DRYER

Robert Andrew Geshner, Warren, N.J., and Louis Joseph Sciambi, Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,805
Int. Cl.² F26B *21/00*
U.S. Cl. 34—239 **12 Claims**



1. A photomask dryer comprising:

a. an enclosed box having at least one door;

b. at least one heated air distributor tube extending into said box from a wall thereof said at least one distributor tube having at least one opening within said box through which air may pass from said at least one distributor tube downward into said box;

c. filter means positioned within said at least one distributor tube for filtering and evenly distributing said air before said air leaves said at least one distributor tube within said box;

d. means external to said box for heating said air which enters said at least one distributor tube;

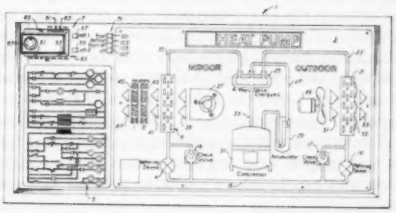
e. a rack adapted to be suspended from said at least one distributor tube and adapted to hold at least one photomask under said at least one opening whereby said at least one photomask placed in said rack will be positioned for drying beneath said at least one distributor tube, said rack being completely removable from said dryer.

4,068,391

REFRIGERATION SYSTEM DEMONSTRATION DEVICE

Richard Seymour Smith, North Syracuse, and Philip Abraham Hider, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 677,426, April 15, 1976, abandoned.
This application Apr. 6, 1977, Ser. No. 785,190
Int. Cl.² G09B *25/02*
U.S. Cl. 35—13 **13 Claims**



1. A demonstration device for demonstrating the operation of an actual refrigeration system, said device comprising:

display means comprising a display of a schematic representation of the actual refrigeration system, said representation including symbols of: heat exchange apparatus, apparatus for changing the pressure and temperature characteristics of the refrigerant, refrigerant flow lines, and apparatus for controlling the direction of refrigerant flow;

apparatus illuminating means associated with said display means for selectively illuminating said apparatus symbols;

refrigerant flow line illuminating means associated with said refrigerant flow line symbols for selectively illuminating said flow line symbols to simulate refrigerant flow and the phase state and temperature of the refrigerant; and

electrical control means for selectively simulating at least one mode of operation of the refrigeration system, said control means including:

first electrical circuit means for effecting energization of the apparatus illuminating means to illuminate the symbols of said apparatus corresponding to the apparatus energized when the actual refrigeration system operates in the simulated mode of operation; and

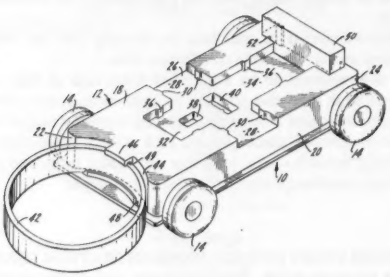
second electrical circuit means for effecting energization of the refrigerant flow line illuminating means to simulate the direction of movement of refrigerant in the flow lines and the phase state and temperature of the refrigerant in the flow lines corresponding to the actual direction of refrigerant flow and the phase state and temperature of the refrigerant, when the actual refrigeration system operates in the simulated mode of operation.

4,068,392

INTERACTION AND RELATIVITY CART

Marshall A. Montgomery, Napa, and Robert Karplus, Orinda, both of Calif., assignors to Rand McNally & Company, Skokie, Ill.

Filed Sept. 28, 1976, Ser. No. 727,457
Int. Cl.[2] G09B *23/08, 23/18*
U.S. Cl. 35—19 R 1 Claim



1. A vehicle for use as an educational toy to demonstrate elastic interaction and magnetic attraction and repulsion, including a vehicle body, a pair of spaced axles journaled in said body, with each axle having a pair of wheels positioned on opposite ends thereof,

a magnet, a recess for positioning and supporting said magnet adjacent one end of said body, said recess being generally parallel to and positioned above one of said axles,

an elastic ring extending outwardly from the opposite end of said body and positioned to contact an obstruction ahead of said body when the vehicle is moved toward an obstruction, means on said body for removably positioning and supporting said ring including a curved recess formed on said vehicle body and latch means integral with said body and positioned on opposite sides of said curved recess,

and a general centrally disposed recess in said body for use in supporting and positioning a replica of a human figure for demonstration purposes.

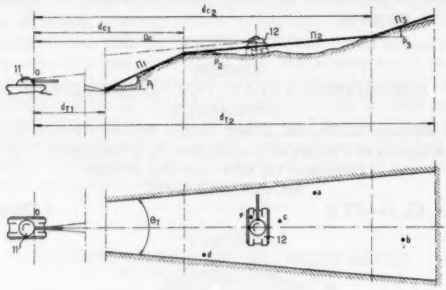
4,068,393

PROJECTILE FIRING TRAINING METHOD AND DEVICE

Vsevolod Tararine, 6, rue Daumier, Paris, France (75016), and Jacques Hubert, 7, rue Parmentier, Asnieres, France (92600)

Continuation-in-part of Ser. No. 605,554, Aug. 18, 1975, abandoned, which is a continuation of Ser. No. 517,770, Oct. 24, 1974, abandoned, which is a continuation of Ser. No. 374,079, June 27, 1973, abandoned. This application Aug. 9, 1976, Ser. No. 712,830
Claims priority, application France, June 27, 1972, 72.23118
Int. Cl.[2] F41G *3/26*
U.S. Cl. 35—25 15 Claims

1. A method of gunnery training including the simulation of the firing of a projectile from a gun up to and including the point of impact of the fired projectile which comprises optically representing the trajectory of said projectile as a function of the aiming of the gun and of reference data which includes a reference line of sight from the gun to the target and the distance to the target from the gun; determining the point of impact of said projectile as defined by its simulated intersection with simulated terrain data which defines at least three ground planes perpendicular to the vertical plane containing the line of sight, said ground planes located respectively around the target, in front of the target, and behind the target, with respect to said gun; and providing an optical indication of said point of impact, with said optical indication being shown either as a visible or hidden impact depending on the position of the point



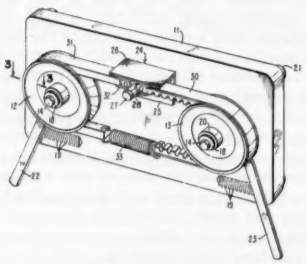
of impact on the ground planes with respect to the target outline.

4,068,394

V-BELT DEMONSTRATOR DEVICE

Waldo A. Sanna, and Carl A. Sand, both of Cincinnati, Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Apr. 8, 1977, Ser. No. 785,159
Int. Cl.[2] G09B *25/00*
U.S. Cl. 35—50 10 Claims



1. A device for demonstrating coefficient of friction of a V-belt comprising a pair of aligned grooved pulleys; an assembly consisting of two dissimilar V-belt segments, a connector securing one end of each segment together, and a tension member securing the other end of each segment together; said assembly passing around said pulleys so that each segment engages a different pulley, and means for rotating each of said pulleys to apply frictional forces to said segments whereby the comparative slippage between each pulley and its corresponding segment provides an indication of the relative frictional characteristics of said segments.

4,068,395

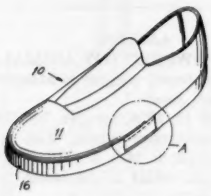
SHOE CONSTRUCTION WITH UPPER OF LEATHER OR LIKE MATERIAL ANCHORED TO INNER SOLE AND SOLE STRUCTURE SEALED WITH FOXING STRIP OR SIMULATED FOXING STRIP

Jonas Senter, 910 Fifth Ave., New York, N.Y. 10011

Continuation of Ser. No. 555,612, March 5, 1972, abandoned. This application Sept. 9, 1976, Ser. No. 722,055
Int. Cl.[2] A43B *00/00;* A43C *13/08*
U.S. Cl. 36—83 4 Claims

1. An article of footwear (10) having a sole structure that comprises an outer sole (12) of rubber material, an inner sole (17) placed inside the footwear upon said outer sole, an upper (11) of leather or like material that is difficult to be bonded to rubber, such as the outer sole, and an outer member (16) dis-

posed about said outer and said inner soles, on the one hand, and said upper on the other; a separate intermediate strip (15) positioned between said outer member and said upper, said intermediate strip (15) being substantially coextensive with said outer member to form a contact surface boundry therewith, said strip being of a textile material readily bondable both to the leather material of said upper and to the rubber material of said outer sole and affixed to a lower peripheral edge (13) of



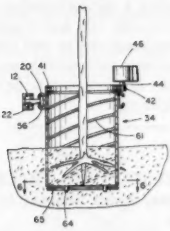
said upper, adjacent the upper edge of said strip, and lasted with its bottom edge into said inner sole; said intermediate strip in cooperation with said outer member forming a common connection between said outer and said inner soles and said upper, whereby said strip provides a substantially vertical contact surface for bonding with said outer member and extending upwardly to overlie and be secured to a part of said upper.

4,068,396

MACHINE FOR UPROOTING TREE STUMPS AND TREES

Harvard H. Langguth, 12111 Marlowe Drive, Garden Grove, Calif. 92641

Filed Jan. 5, 1977, Ser. No. 756,846
Int. Cl.[2] A01G *23/06*
U.S. Cl. 37—2 R **7 Claims**



6. In a tree-balling machine which comprises a cylindrical shell having means at one end to cut an annular trench in the soil, means supporting said shell for rotation and means to rotate said shell, the improvement which comprises at least one helical element secured to the interior face of the shell to compact the soil adjacent said element as the trench is cut, whereby to reduce frictional forces acting between the shell and soil.

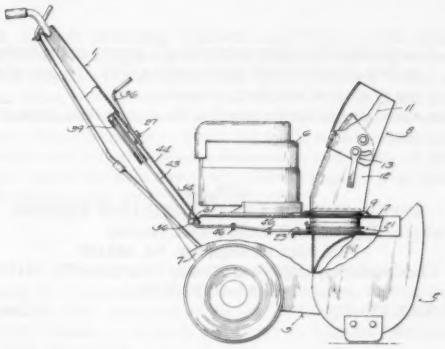
4,068,397

SNOWBLOWER DISCHARGE GUIDE AND CONTROL ARRANGEMENT THEREFOR

Roger J. Bacon, Plymouth, Wis., assignor to Gilson Brothers Company, Plymouth, Wis.

Filed Feb. 2, 1977, Ser. No. 766,057
Int. Cl.[2] E01H *5/04*
U.S. Cl. 37—43 R **10 Claims**

1. A power snowthrower comprising, in combination,
a handle,
a snow collector assembly including a housing and a snow collector disposed within said housing,
a frame assembly connecting said snow collector housing and said handle,
an engine,
a portion of said frame assembly extending generally horizontal and forming a base and having said engine attached thereto,
means defining a generally vertically extending outlet tube in said snow collector housing and communicating with the interior of said housing so that snow collected therein by said collector assembly is directed for discharge through said outlet tube,
said base extending over said tube outlet and including means defining an opening which registers generally with said tube outlet,
a flange assembly positioned around said tube outlet and supported for rotatable movement relative to said tube outlet,



a discharge guide assembly adapted to direct snow passing therethrough laterally of said snowthrower,
means attaching said discharge guide to said base at said opening for support of said discharge guide on said base and for rotatable movement of said discharge guide relative to said opening,
means defining a driving connection between said discharge guide and said flange assembly,
a control lever,
means supporting said control lever on said handle for pivotal movement relative to said handle,
and flexible cord means extending along said handle and frame assembly from said lever to said flange assembly for transmitting pivotal movement of said lever to said flange assembly so that pivotal movement of said lever is translated into rotational movement of said flange assembly and through said drive connection to said discharge guide.

4,068,398

KNOCKDOWN SIGN ASSEMBLY

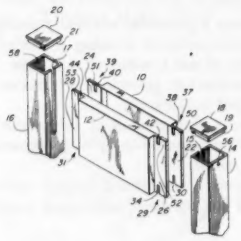
Dominick Parisi, Park Ridge, Ill., assignor to Spanjer Brothers Inc., Chicago, Ill.

Filed June 21, 1976, Ser. No. 698,485
Int. Cl.[2] G09F *1/00*
U.S. Cl. 40—607 **3 Claims**

1. In a knockdown sign assembly having posts which are hollow and open at the top and spaced a predetermined distance apart with a display panel having a flange at each end thereof for engaging each of said posts in support therebetween, the combination with said sign assembly of:
a. a bottomed slot in each of the mutually facing walls of said posts extending downwardly from and opening to the top thereof and engaging a respective one of the panel end flanges therein;
b. bottom slip-joint means comprising a slot at the bottom of each flange for engaging the wall of the respective post at the bottom of the bottomed slot therein, said slip-joint slot

having a width slightly greater than the thickness of the post wall;

c. a cap for each post having a shouldered pilot inserting in each of the open tops thereof;



d. a top slip-joint means comprising a groove in the bottom surface of each of said caps engaging with a tongue at the top of each of said flange members; and

e. a fastening means for securing the caps on their respective posts.

4,068,399

APPARATUS FOR USE IN LONG-LINE FISHING

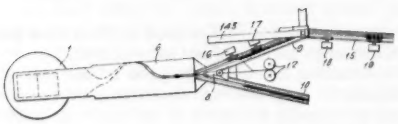
Kolbjorn Bjorshol, 6560 Langoyneset, Norway

Filed May 13, 1976, Ser. No. 686,099

Claims priority, application Norway, May 16, 1975, 751750

Int. Cl.[2] A01K *79/00*

U.S. Cl. 43—4.5 **5 Claims**



1. An apparatus for use in long-line fishing, comprising at least one fishing hook store adapted for individual advancing of fishing hooks, at least one passage adapted to advance a series of snoods each attached to a fishing line and provided with a snood head and at least one blow device, each adapted to force a fishing hook neck into secured engagement with a snood head.

4,068,400

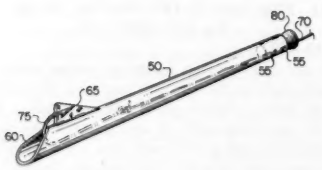
FISHING DEVICE

Horace S. McCoy, 11203 Lanewood Circle, Dallas, Tex. 75218

Filed Jan. 12, 1976, Ser. No. 648,101

Int. Cl.[2] A01K *97/00*

U.S. Cl. 43—53.5 **5 Claims**



1. An improved fishing device for attachment to a fishing line having a hook at one end thereof, said device comprising:

an elongated hollow member open at both ends and having at least one hole in its wall for providing frictional engagement between said line and said member when said line is threaded through said at least one hole;

at least one notch, with a generally pointed deep end formed in one end of said hollow member; and

at least one fin projecting outward from said hollow member,

said notch having said fin associated therewith with the fin being longitudinally displaced from the deep end of the notch.

4,068,401

SELF-POWERED TOY ANIMAL

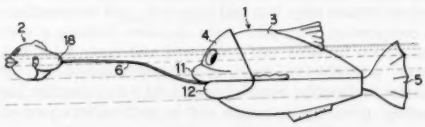
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Toy Company Limited, Tokyo, Japan

Filed July 19, 1976, Ser. No. 706,525

Claims priority, application Japan, Aug. 19, 1975, 50-114212[U]; United Kingdom, May 6, 1976, 18644/76

Int. Cl.[2] A63H *23/10, 14/02*

U.S. Cl. 46—92 **7 Claims**



1. A toy comprising:

a floatable and relatively small toy animal;

a floatable and relatively large toy animal having a generally hollow interior and an openable mouth;

a reel in said interior;

a paddle projecting from said large animal and movable to displace said large animal in a liquid;

a line having one end attached to said small animal and another end attached to said reel, said line passing through said mouth and being windable on said reel; and

drive means including a spring windup mechanism in said interior attached to said reel and to said paddle for winding said line around said reel to pull said small animal into said interior through said mouth and to oscillate said paddle and thereby displace said large animal in a liquid in which same is floating.

4,068,402

TOY VEHICLE AND TRACKWAY

Yutaka Tanaka, Urawa, Japan, assignor to Toytown Corporation, Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,195

Int. Cl.[2] A63H *19/10*

U.S. Cl. 46—216 **6 Claims**

1. An amusement device, comprising:

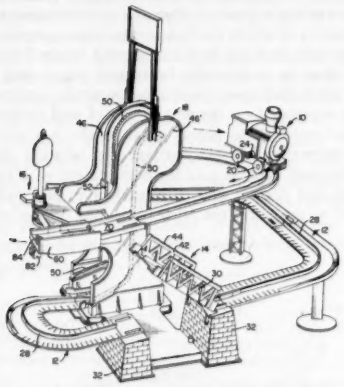
a vehicle provided with wheels freely mounted for rotation, first driven gears mounted for rotation and a second stationary gear mounted concentrically with respect to one of said first gears; and

a trackway against which said wheels of said vehicle rest and provided with guide means for directing said vehicle therealong, and including:

a first section terminating at a first end, a second section beginning at a second end, a carrier for said vehicle, means mounting said carrier to rotate between said first and second ends of said first and second sections, and spring means normally urging said carrier into abutting relationship against said first end such that as said vehicle leaves said first end entering said carrier said vehicle and said carrier are rotated to said second end of said second section at which time said vehicle leaves said carrier entering said second end of said second section, and

a third section terminating in a third end, an upstanding tower positioned at said third end, said tower having

upstanding side portions provided with first continuous racks positioned to be engaged by said rotating first gears of said vehicle to propel said vehicle upwardly along said side portions of said tower, one of said side portions also being provided with a second rack spaced apart from said first rack and positioned to be engaged



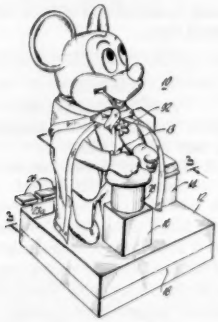
by said second stationary gear of said vehicle to cause said vehicle to rotate about said second gear simultaneously while moving upwardly along said side portions of said tower, and a fourth section terminating in a fourth end located in the vicinity of the uppermost portions of said first racks such that as said vehicle leaves said tower it enters said fourth section.

4,068,403

FINGER OPERATED MAGICIAN SIMULATING ANIMATED TOY

Hal Weiser, New York, N.Y., assignor to Durham Industries, Inc., New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,189
Int. Cl.[2] A63H *33/26, 11/00*
U.S. Cl. 46—241 **13 Claims**



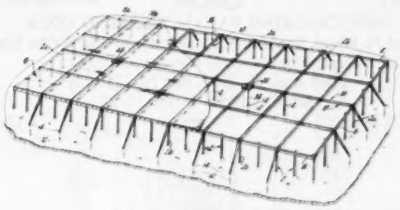
1. An animated toy device comprising an animal figure simulating upright body member including a first arm member supported proximate its inner end for swinging between a raised position and a lowered forwardly downwardly extending position, manually operable first actuating means for swinging said arm member between its raised and lowered positions, a permanent magnet carried by said arm member proximate its outer end, an article at least partially formed of a magnetic material and means for removably supporting said article proximate said magnet when said arm is in its lowered position.

4,068,404

SHADE-PRODUCING STRUCTURE AND METHOD

Robert T. Sheldon, P.O. Box 486, DeLeon Springs, Fla. 32028

Filed Dec. 17, 1975, Ser. No. 641,622
Int. Cl.[2] A01G *13/02*
U.S. Cl. 47—26 **20 Claims**



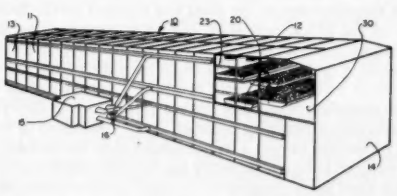
1. A shade producing structure comprising a shade cloth supported on uprights above a land area and including cables above the shade cloth to prevent excessive billowing thereof, a hold down restraint for said shade cloth comprising anchor means fastened to the land within the shade structure, a hold down cable attached at its lower end to the anchor means and passing upwardly through the shade cloth and means on the upper end of said hold down cable slidably engaged to at least one of said cables above said shade cloth.

4,068,405

AUTOMATIC FOOD PLANT PRODUCTION

Joseph W. Campbell, Glendale, and Ralph Siebert, La Canada, both of Calif., assignors to Joseph W. Campbell, Glendale; Ralph Siebert, La Canada and Harry R. Highkin, Sherman Oaks, all of Calif.

Filed Sept. 11, 1975, Ser. No. 612,307
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—65 **2 Claims**



1. An environmentally controlled growing chamber comprising;

a substantially closed elongated chamber;

means for supplying selected gaseous atmosphere to the chamber to support growth of the plants therein;

lamp means positioned to radiate over a longitudinally extending region within said chamber;

a plurality of plant holding means;

means for transporting said plant holding means through said longitudinally extending region to expose plants therein to illumination through said lamp means;

said transport means including continuous conveying means including end sprockets journaled about generally horizontal axes for reversing the direction of the plant carrying means to transport the plant carrying means through said illuminated longitudinally extending region and retrace through a region of lesser illumination;

said chamber including a work station located adjacent to one of said end sprockets from which all manual plant tending may be performed on plants in said plant carrying means as the plants move around said end sprocket between said regions;

whereby a worker at said work station has access to all plants in the said plant carrying means during each cycle

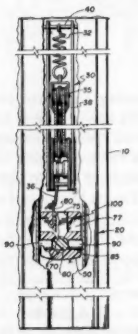
of movement of said transport means and successive access to and ready view of the top of the foliage of the plant, the sides thereof, and the stem portion and planting soil as plants transverse the end sprocket region without the need of stooping.

4,068,406

SIDE CAMMING BALANCE SPRING LOCK

Edward H. Wood, Sanford, N.C., assignor to Jim Walter Corporation, Tampa, Fla.

Filed Aug. 19, 1976, Ser. No. 715,724
Int. Cl.[2] E05D *13/10, 15/22*
U.S. Cl. 49—181 **8 Claims**



1. A side camming balance spring lock for use in a jamb of a vertical channel window comprising, a block slidably positioned in each jamb and adapted to slide therein, said block having a cylindrical aperture therethrough extending from a back to a front surface of the block, a cylindrical shaft having an annular collar at one end of the same bearing against the back surface of the block and "U" shaped notch extending from the other end of the shaft and exposed on the front surface of the block, said shaft having at least one flat surface extending axially of the block and intermediately the extent of the shaft, a first recess in the block extending from the top of the block to the cylindrical aperture, a second recess in the block extending from a side surface of the block to the cylindrical aperture, a camming member slidably mounted in the second recess and having a length longer than the second recess and adapted to be contacted by the flat and cylindrical surfaces of the shaft upon rotation of the shaft in the cylindrical aperture, a notched surface in the side of the first recess adapted to receive a clip to be connected to a balance spring, said "U" shaped notch in the shaft being adapted to receive a key attached to a sash which upon tilt of the sash from the jamb rotates the shaft to project the camming member out of the side of the block and against the wall of the jamb, and plug means removably mounted in the first recess to secure the clip in the notched surface of the recess and close the communication of the "U" shaped notch in the shaft of the block.

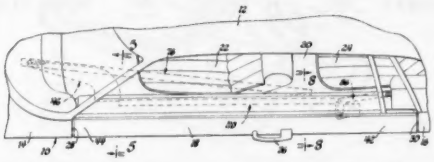
4,068,407

SLIDING VEHICLE DOOR

Edward G. Podolan; Francis C. Przybysz, both of Utica, and Thadius F. Jozefczak, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,552
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—215 **3 Claims**

1. Support and guide mechanism for a swingable and slidable door assembly of a vehicle adapted to cover a body opening defined between forward and rearward pillars and between an upper roof edge portion and a lower body edge portion, comprising: extended arm means attached to one end portion of the door and with a portion engaging a track formed in the vehicle body; said track extending along said opening and curving laterally inward at one end so that said one end portion of the door is located flush with an adjacent pillar portion of the body when in a closed operative position; a link arm supporting the other end portion of said door and mounted on the other pillar member; said link arm mounted for pivotal movement about a substantially vertical axis from a closed door position in which the link arm is in a generally fore and aft orientation to an open door position in which the link arm projects laterally outward from the vehicle body; first and second tracks formed in the vehicle door in a generally horizontal plane; said link arm having upper and lower projecting portions; a roller carriage member supported on the end of one of said projecting portions and mounted to permit rotation about a vertical axis; rollers supported by said carriage for rotation about both horizontal and vertical axes for engagement with one of said tracks in said door; a pair of spaced pivot and guide rollers mounted on the end of the other projecting portion of said link



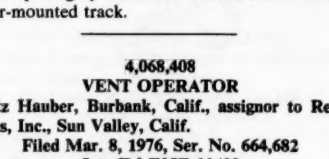
arm and pivotal about generally vertical axes; the first of said spaced rollers mounted in line with the axis of the projecting portion and the second of said spaced rollers being offset mounted so as to be spaced laterally outward from the first spaced roller when the link member is in a closed operative position whereby the first and second spaced rollers move into alignment with each other and the other of said door-mounted tracks as the pivotal link arm swings laterally outward from its closed door operative position; a cam plate supported by said door adjacent the end of said other door-mounted track and having curved guide surface extending in substantial horizontal orientation and opening to the other door-mounted track, said second spaced roller engaging said guide surface during swinging movement of said link arm from the laterally outward orientation of said second roller with respect to said first roller when the door is closed to the aligned orientation between said rollers and said other door-mounted track when said door is opening by movement of both rollers through said other door-mounted track.

4,068,408

VENT OPERATOR

Peter Fritz Hauber, Burbank, Calif., assignor to Reflectolite Products, Inc., Sun Valley, Calif.

Filed Mar. 8, 1976, Ser. No. 664,682
Int. Cl.[2] E05F *11/00*
U.S. Cl. 49—324 **1 Claim**



1. A closure assembly for recreational vehicles having an opening in the surface thereof comprising;

a closure cover;

means hinging said closure cover from one side thereof to overlie said opening;

an operator assembly including a unitary body portion af-

fixed to said recreational vehicle at the side of the opening therein opposite the hinged side of the closure cover;

an operator shaft including a worm gear portion mounted for rotational movement within said operator assembly body portion;

operator arms engaging said operator shaft for arcuate movement thereby and engaging said cover to open and close said cover;

said body further defining a recess for receiving operator arms including access from said recess to opposite sides of said worm gear portion of said operator shaft;

said body portion further including an integral bridge portion extending across said recess and defining therein a bearing recess for said operator shaft and the outer surface of said bridge portion being a mounting surface of said body whereby loads from said closure cover are transferred via said operator arms to said shaft and to said operator body and the recreational vehicle through said bridge portion.

4,068,409

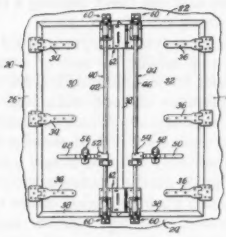
ANTI-RACKING MEANS FOR DOORS

Clarence E. White, Kenosha, Wis., assignor to White Welding and Mfg., Inc., Kenosha, Wis.

Division of Ser. No. 565,750, April 7, 1975, Pat. No. 4,014,138. This application Dec. 27, 1976, Ser. No. 754,579

Int. Cl.² E05C 7/02

U.S. Cl. 49—367 **2 Claims**



1. In an apparatus including anti-racking means for use with a door frame, a pair of doors vertically hinged to the frame and presenting free edges which are adjacently located when the doors are in closed position, and rotary bar door locking mechanism, said anti-racking means comprising a first bracket having a base portion secured to one of the doors and having a side portion adjacent the free edge of the door, a second bracket having a base portion secured to the other door and having a side portion adjacent the free edge of said other door, said side portions of said brackets being provided with interengageable means, said side portions of said backets being disposed in overlapping relationship when the doors are in closed position, and said interengageable means being interengaged when the doors are in closed position for reinforcing the doors and the door frame, the improvement comprising:

said side portion of a first of said brackets being formed with a vertically oriented tongue extending perpendicular to the plane of the one door, and a vertically oriented aperture; and said side portion of the second of said brackets being formed with a vertically oriented tongue extending perpendicular to the plane of the other door, and a vertically oriented aperture; said tongue of said first bracket being interengaged with said aperture of said second bracket, and said tongue of said second bracket being interengaged with said aperture of said first bracket, when the doors are in closed position.

4,068,410

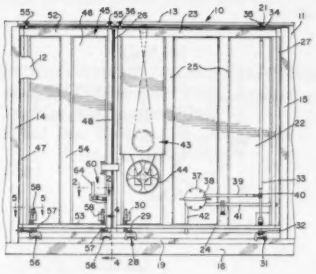
RAILWAY CAR DOOR LOCKING MECHANISM

Walter J. Marulic, Gary, Ind., and Ray L. Ferris, Thornton, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,494

Int. Cl.² E06B 3/42

U.S. Cl. 49—370 **5 Claims**



1. In a railway car having a side wall provided with a door opening, first and second doors slidingly supported on said car and movable from a closed position over said opening to one side thereof to an open position,

door actuating mechanism on said first door including reciprocating bolt means for locking said first door in said closed position,

said second door including a vertically extending hollow side frame member at one edge thereof positioned in contiguous relation to said first door in the closed position thereof, the improvement comprising:

locking means for said second door including;

a locking bar supported within said hollow side frame member for vertical reciprocation;

a keeper supported on said car below said opening adapted to be engaged by said locking bar;

means for reciprocating said locking bar including a bell crank lever pivotally mounted on said second door, and having a vertical handle portion and a leg extending generally horizontally in the locking position of said locking means;

an actuating link pivotally connected to said second door and to said bell crank lever and to said locking bar and in the locking position of said locking means extending lengthwise diagonally downwardly from one end at said bell crank leg to its other end connection with said locking bar,

said one end of said actuating link including a slot and said pivotal connection of said leg to said link comprising a first pivot stud extending through said slot,

said stud being located in the locking position of said locking means at one end of the slot; and

said link having both ends bifurcated and respectively embracing said upper end of the locking bar and said leg for holding said link in operative relation to said leg and bar.

4,068,411

DOOR TRACK CONSTRUCTION

Donald C. Bodinger, Portage; Paul A. Tombers, Merrillville, and Richard C. Snyder, Michigan City, all of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 17, 1977, Ser. No. 760,046

Int. Cl.² E06B 7/14

U.S. Cl. 49—408 **7 Claims**

1. A railway box car having a wall including a door opening,

a side sill construction below said door opening including a longitudinally extending side sill,

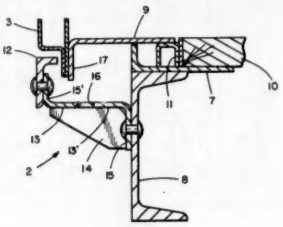
a floor supported on said side sill,

a threshold plate supported on and projecting outwardly from said side sill,

a door supported on said car for sliding movement between open and closed positions relative to said door opening, the improvement of a door track construction positioned below said door comprising;

a track support including bracket means having a continuous horizontal web member extending the width of said door opening, and to one side thereof,

means connecting an inner side of said web member to said side sill,



a door track coextensive with said web member,

means connecting an outer side of said web member to said track

said track member having an upper inwardly extending door supporting surface, and

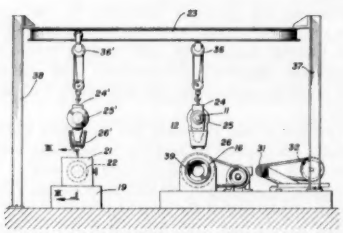
a plurality of gusset members supported on said side sill and connected to said web members substantially throughout the length thereof.

4,068,412

GRINDING MACHINE

Edward C. Camp, Princeton; Ellsworth C. Enos, Holden, and Dennis Michael Bombara, Douglas, all of Mass., assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Nov. 12, 1976, Ser. No. 742,411
Int. Cl.² B24B *5/04, 41/06*
U.S. Cl. 51—5 D **3 Claims**



1. Grinding machine, comprising

a. a workpiece-holding chuck having a locating surface and having an open-ended container normally holding a low-temperature melting alloy in which a first portion of the workpiece is embedded with a second portion of the workpiece with a reference surface exposed on which the grinding operation is to be performed,

b. a workhead and a wheelhead mounted for relative controlled movement to perform the grinding operation, the workhead having a locating surface for engagement by the locating surface on the chuck, and

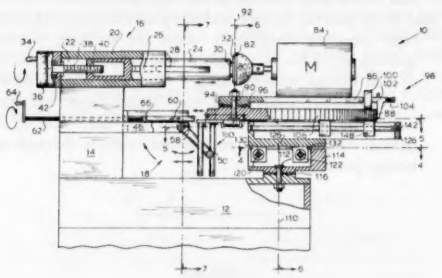
c. a setup head remote from the workhead having a locating surface exactly similar to the locating surface on the workhead and having a clamping means for engaging the said reference surface to hold the workpiece in the container in such a way that the locating surface of the chuck and the reference surface of the workpiece lie in a predetermined geometric relationship.

4,068,413

ADJUSTABLE LENS GRINDING APPARATUS

Jack M. Suddarth, 5551 18th, St. Petersburg, Fla. 33710

Filed Oct. 2, 1975, Ser. No. 619,041
Int. Cl.² B24B *9/14, 17/02*
U.S. Cl. 51—55 **30 Claims**



6. A lens grinding apparatus of a type having a chuck for securing a lens blank thereto and an abrading cup having an annular abrading surface thereon for sweeping through said lens blank during said abrading stroke, wherein an improvement in the apparatus for guiding said abrading cup during said abrading stroke comprises:

a first member for supporting said chuck and said lens blank secured thereto, said lens blank defining a plane generally perpendicular to an axis of said chuck;

a second member for movably supporting said abrading cup, said abrading cup having an axis of rotation centered therethrough and an annular abrading surface at the distended circumference thereof, with said abrading cup being spaced longitudinally from said chuck;

a guide having a cambered surface thereon and guide following means movably coupled to said guide for following along said guide during relative motion therebetween, said guide and said guide following means being operably interposed between said first member and said second member for guiding the sweep of said abrading cup through said lens blank during said abrading stroke; and

first means for changing the effective camber of said cambered surface of said guide, whereby said sweep of said abrading cup through said lens blank may be altered to provide a plurality of different lens surfaces.

4,068,414

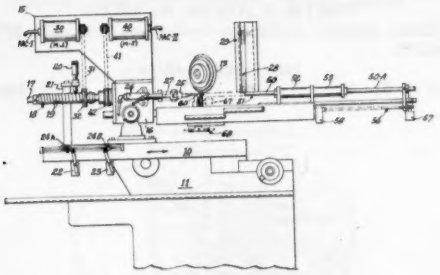
AUTOMATIC FLUTE GRINDING MACHINE

Charles Thomas Breitenstein, Elk Grove Village, and Allen Roland Holecek, Rockton, both of Ill., assignors to Spiral Step Tool Company, Elk Grove Village, Ill.

Continuation of Ser. No. 697,558, June 18, 1976, abandoned.
This application Apr. 22, 1977, Ser. No. 789,991
Int. Cl.² B24B *3/24*
U.S. Cl. 51—95 LH **20 Claims**

1. A machine for spiral grinding and fluting wherein a reciprocable carriage supports a rotary work spindle with automatic chuck and chuck-loading means, characterized in that separate pulse-activated motors respectively drive the carriage and spindle; a source of drive pulses for said motors; first circuit means including digitally presettable switch means operative to preset digital values representing the speed and direction of motor operation with means converting said values into binary motor pulsing values; second circuit means operative under control of the first circuit means to apply said binary pulsing values to each motor to produce directional and speed response thereof in accordance with the setting of said presetta-

ble switch means; third circuit means including further digitally-presettable ratio switch means operative to control the speed of said motors in desired ratio to govern spiral displacement of the chucked work piece relative to a tool with respect to which the carriage travels from a home position to an advanced working position; fourth circuit means operative responsive to a cycle start switch to initiate and conclude predetermined duty-cycle operation of said machine in accordance with setting of said presettable switch means in each of which



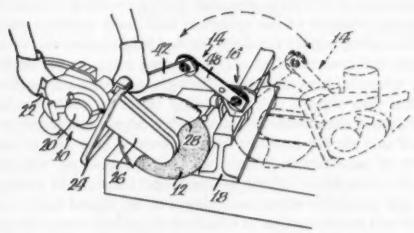
said carriage advances from said home to said advanced positions and returns to home position a predetermined number of times in each cycle and said spindle rotates a chucked work piece as aforesaid during at least a predetermined portion of the forward working pass of the carriage; fifth circuit means operative to preset the number of times said carriage will advance in working passes in each cycle, and to cause said chuck means to discharge the work piece at the conclusion of the last pass.

4,068,415

RAIL CUTTING APPARATUS

William P. McIlrath, Racine, Wis., assignor to Racine Railroad Products, Inc., Racine, Wis.

Filed Jan. 12, 1976, Ser. No. 648,749
Int. Cl.[2] B24B *23/02*
U.S. Cl. 51—178 **3 Claims**



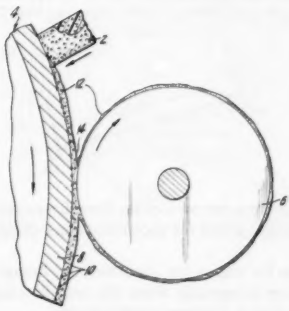
1. In a rail cutting apparatus, the combination of:
a base adapted to be disposed on the head of a rail;
opposed, inwardly directed fingers on said base for disposition about the head of a rail, the finger(s) on one side of the base being movable toward the opposed finger(s);
means for applying a clamping force to said fingers to clamp said base to the head of a rail;
a pair of links having adjacent ends pivotally interconnected for relative rotation about an axis generally parallel to the direction of elongation of the head of a rail;
means pivotally connecting an end of one of said links remote from said adjacent end to said base for limited rotation about an axis parallel to said one axis;
a cutting tool pivotally connected to the end of the other link remote from said adjacent end,
whereby when said apparatus is clamped to a rail, said cutting tool may be swung to either side thereof to cut the rail without removing said apparatus from the rail;
said base being an open-ended tube; and further including an adapter plate adapted to be interposed between said base and a railhead to adapt said apparatus for cutting rail of differing weight; and means for selectively securing said adapter plate in
a. a first position against the underside of said base, and
b. a second position stored within said tube.

4,068,416

GRINDING WHEEL DRESSING METHOD

Phillip E. Bonnice, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Dec. 20, 1974, Ser. No. 535,016
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—325 **9 Claims**



1. A method for dressing a bonded rigid, grinding wheel comprising the steps of (i) setting the wheel against a workpiece at substantially zero clearance, (ii) rotating the wheel and applying a wheel dresser comprising a multiplicity of abrasive crystals dispersed in a normally solid friction-meltable organic polymeric matrix to the moving surface of said grinding wheel whereby the matrix is melted and the crystals and melted polymer are spread on the surface of the wheel, and (iii) abrading said wheel surface having said crystals spread thereon against said workpiece to remove selected portions of the surface of said wheel, said steps (i) and (ii) being carried out in any order, sequentially or simultaneously.

4,068,417

FIRE VENT

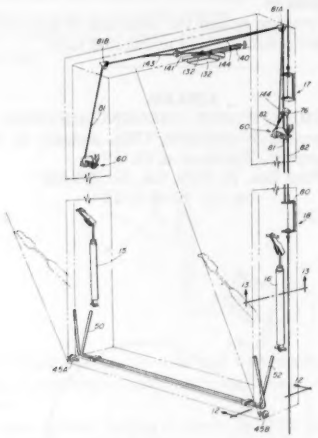
Joseph R. Anghinetti, Kennebunkport, and Paul A. Couture, Emery Mills, both of Maine, assignors to Wasco Products, Inc., Sanford, Maine

Continuation-in-part of Ser. No. 341,780, March 15, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,808
Int. Cl.[2] E05F *15/20*
U.S. Cl. 52—1 **24 Claims**

1. A vent for a building comprising;
a fixed frame,
a movable frame adapted to fit within said fixed frame when in a closed position,
a panel means for insertion into said movable frame,
means for pivotally securing said movable frame to said fixed frame,
means for urging said movable frame to an open position,
latch means for maintaining said movable frame in the closed position,
means for releasing said latch means to permit said movable frame to move to its open position,
and means for limiting the open position of said movable frame including a pair of shock absorbers secured at oppo-

site ends to said fixed frame and movable frame respectively,

said fixed and movable frames each including spaced walls with the walls of the fixed frame facing the walls of the movable frame and being interdigitally arranged to form a



space between one wall of the fixed frame and one wall of the movable frame for accommodating the shock absorbers,

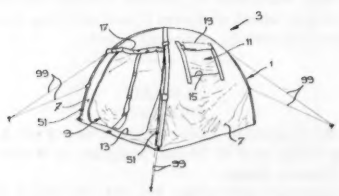
said means for urging not operable even though said releasing means is operable when the outside wind velocity is greater than a predetermined velocity.

4,068,418

COLLAPSIBLE SHELTER

Jean-Pierre Masse, 900 Tessier Street, Apt. 202, Sherbrooke, Quebec, Canada

Filed June 11, 1976, Ser. No. 695,198
Int. Cl.² E04B *1/34*
U.S. Cl. 52—2 **5 Claims**



1. A collapsible shelter having a flexible outer wall structure and an inflatable tubular armature structure fixed to said wall structure and capable, when inflated, of causing erection of said wall structure as well as collapse thereof when deflated, said armature structure being made of a plurality of structural rib members having, when inflated, a predetermined curvature, each of said structural members comprising:

an inner air-impermeable inflatable elastic tube and means, at the ends thereof, for closing said tube;

at least one outer non-expandible flexible sheath containing said inner tube snugly when the latter is inflated into said predetermined curvature, whereby to restrain its outward expansion and prevent it from rupturing,

wherein said sheath is formed from a pair of elongated strips of like sizes precut according to said predetermined curvature whereby to provide uniform stress concentration in said sheath when said inner tube is inflated, and

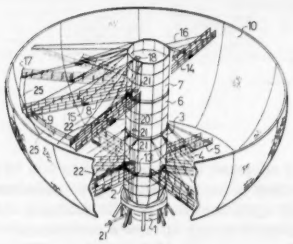
means joining said strips along the longitudinal edges thereof to form said sheath.

4,068,419

INSIDE SCAFFOLDING FOR LARGE METALLIC STRUCTURES AND METHOD OF USING SAME

Jean-Pierre Decoppet, Corseaux, Switzerland, assignor to General Dynamics Corporation, St. Louis, Mo.

Filed Feb. 4, 1976, Ser. No. 655,170
Claims priority, application Switzerland, Feb. 14, 1975, 1860/75
Int. Cl.² E04H *12/34*
U.S. Cl. 52—40 **3 Claims**



1. Removable scaffolding structure for constructing a spherical tank from metallic plates which comprises a free-standing central tower which is divided into a plurality of detachable sections that are aligned one section atop another and which tower contains equipment for the welding of the spherical tank, the lowermost section of said central tower being supported in base means that is fixed to the ground, each said detachable section being supported in turn upon the next lower section of said tower, radially extendable passageways connected to several of said tower sections by hinges at one end thereof, which passageways are each divided into at least two sections that are mutually displaceable, and stays connected to each of said passageways at a location spaced from said hinged end and to an upper location on said tower so as to support said passageways in working positions during welding operations in the construction of the spherical tank, said welding equipment including supply conduits for welding operations, which conduits are connected to corresponding plugs at the outside of the spherical tank structure through said base, connections between said supply conduits being made at each junction between said detachable sections and working connections to each of said supply conduits being provided as a part of each section of said tower which carries passageways, whereby after the completion of the welding operations, said passageways are pivotable about said hinges to be folded back to lie against said tower section to which each passageway is hinged, allowing each of said tower sections including the welding equipment contained therein to be withdrawn sequentially from the structure through an orifice of relatively small diameter which is left in the top of the spherical tank.

4,068,420

DEMOUNTABLE MULTIPLE LEVEL BUILDING STRUCTURES

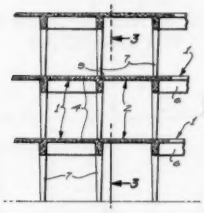
Edward K. Rice, Los Angeles, Calif., assignor to Unicon Parking Structures, Inc., Van Nuys, Calif.

Continuation of Ser. No. 93,097, Nov. 27, 1970, abandoned. This application Mar. 13, 1973, Ser. No. 340,663
Int. Cl.² E04B *1/348*
U.S. Cl. 52—79.9 **3 Claims**

1. A building floor structure, comprising:

a. slab set including a plurality of elongated supporting slabs

disposed is spaced relation and having supporting means thereunder, said supporting means for each supporting slab including a pair of longitudinal beams at the side margins thereof, and supporting legs at the extremities thereof, each supporting slab also having elongated side margins formed with supporting recesses; and a plurality of elongated supported slabs disposed between the supporting slabs and having elongated side margins resting in the recesses with edge surfaces of said supporting and supported slabs in abutting relation, the supporting and supported slabs being disposed in coplanar relation;



b. the supporting and supported slabs of the slab set having transversely extending tendon guideways terminating in registry at the side margins of the slabs between the upper and lower surfaces of the slabs to form continuous parallel guideways between the extreme slabs of the slab set;

c. a plurality of tensioned tendons slidably received and slidably maintained in each continuous guideway;

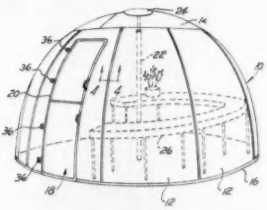
d. and means attached to the extremities of each tendon and bearing against the extreme slabs of the slab set to maintain distributed tension force in the tendons and distributed transverse compression force through and between the slabs.

4,068,421

FRAMELESS SHELTER FOR SUNLIT ENCLOSURES SUCH AS GREENHOUSES, SOLARIUMS AND POOL SHELTERS

John M. Marovich, 1564 Welling, Troy, Mich. 48084

Filed Oct. 1, 1976, Ser. No. 728,613
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—80 **11 Claims**



1. A frameless hemispherical structure of rigid translucent plastic material comprising:

a lower tier consisting of a first plurality of adjacent congruent truncated segments of a sphere, each segment having substantially U-shaped integral concave lateral edge channels which overlap and nest within the opposite edge channel of the adjacent panel to form a first series of depressions which extend throughout the vertical length of the lower tier and are uniformly spaced therearound;

an upper tier consisting of a second plurality of congruent hemispheroidal segments having substantially U-shaped integral concave lateral edge channels which overlap and nest within the edge channels of adjacent panels to form a second series of depressions which extend the vertical length of the upper tier and are uniformly spaced therearound;

all of said panels in said first and second pluralities having a common uniform compound radius of curvature;

the upper edge of the lower tier panels and the lower edge of the upper tier panels also having substantially U-shaped integral concave channels which overlap and nest within one another to form a continuous horizontal depression which encircles the structure and is contiguous to both the first and second series of spaced depressions;

the number of panels in the lower tier being greater than the number of panels in the upper tier;

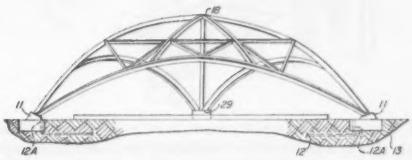
and fastener means sealingly disposed through the panels in the depressions to secure the structure together.

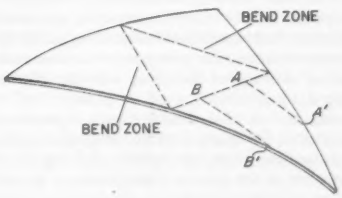
4,068,422

ROOFING FOR DOMICAL SHELL STRUCTURE

John S. Sumner, 728 N. Sawtelle, Tucson, Ariz. 85716

Continuation-in-part of Ser. No. 544,766, Jan. 28, 1975, abandoned. This application Mar. 2, 1976, Ser. No. 663,191
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—80 **9 Claims**





1. A domical structure comprising:

a plurality of bases,

a first plurality of arcuately shaped beams each carried on at least one end by a different one of said bases and extending therefrom in a substantially vertical plane,

a first means for connecting said first beams at the apex of said structure,

a plurality of arcuately shaped edge beams supported on adjacent bases and extending upwardly and outwardly therebetween to define the perimeter of said structure,

a second plurality of arcuately shaped beams carried on at least one end by one of said edge beams and at their other ends by said first means at the apex of said structure,

said second plurality of arcuately shaped beams being spaced around the domical structure between each of said first plurality of arcuately shaped beams,

said first and second plurality of beams and said plurality of edge beams being arcs of great circles and forming a structural framework defining spherical triangular openings,

said spherical triangular openings each having a corner of said triangles at the apex of said domical structure, and

a domically shaped covering for the structure comprising a plurality of originally flat panels each of a curved triangular configuration the edges of which lie on the arcuate beams of said framework in edge to edge assembly around

said structure and each panel covering one of said curved triangular openings formed together a dome-like outer configuration,

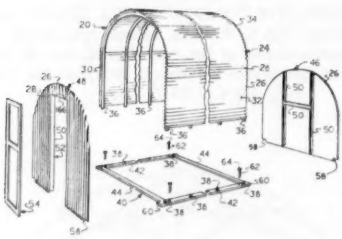
each of said panels being formed by three curved substantially isosceles triangles formed in the corners of each spherical triangular opening together with an interconnecting plane triangle.

4,068,423

SIMPLIFIED GREENHOUSE STRUCTURE SUITABLE FOR MASS PRODUCTION AND FIELD ASSEMBLY

Edwin R. Marsh, 2523 1/2 Tacoma Ave., Tacoma, Wash. 98402

Filed Mar. 1, 1976, Ser. No. 584,720
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—86 **8 Claims**



1. A greenhouse, rapidly made in initially flat subassemblies, preferably at a factory site, then easily handled and transported to an erection side, while flat, and then rapidly arranged and rapidly erected by one person, the manufacture and erection being undertaken while using conventional materials and only standard hand held tools, comprising:

a. a roof and sidewall subassembly, manufactured and shipped as a flat, unitary structure, to be manually flexed into an arched protective weather cover at the greenhouse construction site, comprising in turn a continuous flexible sheet of corrugated fiberglass, with the corrugations arranged longitudinally, and a plurality of transverse, spaced, and parallel, flexible plastic pipes secured to the continuous fiberglass sheet by using self tapping screws;

b. a planar base frame subassembly, defining the foundation perimeter of the erected greenhouse, to be positioned at the greenhouse construction site and to be secured to the ground and to retain the roof and sidewall subassembly as an arched protective weather cover; and

c. planar end subassemblies, each comprising, a preflexed plastic pipe which also serves as the endmost arched plastic pipe support of the roof and sidewall subassembly, attached to a vertical sheet of corrugated fiberglass having the corrugations arranged vertically, and having an essentially horizontal bottom edge, and also having upper and side edges matching the curve of the arched plastic pipe, to thereby fit within the respective ends of the roof and sidewall subassembly after its securement to the planar base frame subassembly.

4,068,424

RAINWATER RUN-OFF DISPERSION SYSTEM

Alfred W. Madfis, 38 Pine St., Swampscott, Mass. 01907

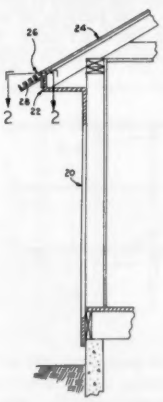
Filed Dec. 6, 1976, Ser. No. 747,896
Int. Cl.[2] E04D *13/00*
U.S. Cl. 52—94 **5 Claims**

1. A rainwater run-off dispersion system and method for disposing of rainwater run-off from a sloped or pitched roof of a building, by converting said rainwater into a non-errosive shower of droplets and distributing over an extended area of the ground, by means of a structure mounted at the roof edge, which comprises:

a receiving surface, solid and impervious, elongated and of sufficient width to intercept the path of rainwater run-off flowing therefrom,

a plurality of raised, intermediate baffles, which project upwards from said receiving surface, and extend continuously in the direction of elongation, to impede the flow of said rainwater run-off,

a final breaker baffle which projects upward from said receiving surface, and extends continuously in the direction of elongation, at the edge of said receiving surface furthest from, but in a plane parallel to said roof edge, and from which, said rainwater run-off overflow falls in showers of droplets to the ground,



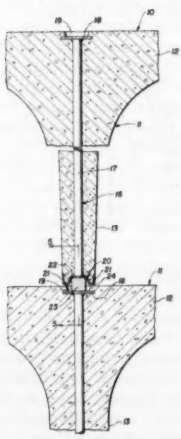
a mounting means to secure said structure to the facia board of said building, so that said receiving surface is tangentially aligned and firmly positioned against roof edge.

4,068,425

MODULAR MAUSOLEUM

Edward S. Czorniak, Chicago, Ill., assignor to Permacrete Products Corporation, Columbus, Ohio

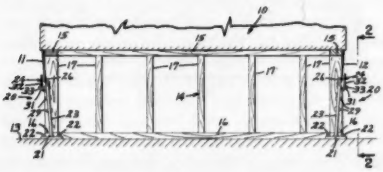
Filed Apr. 5, 1977, Ser. No. 784,814
Int. Cl.[2] E04H *1/04*; E04B *1/343*
U.S. Cl. 52—136 **11 Claims**



1. In a modular multi-level concrete structure formed from vertically stacked cast concrete modules, each module having a vertical load bearing wall in alignment with like walls of other modules in said structure, the improvement comprising a

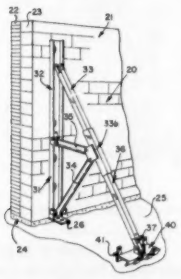
continuous top to bottom load bearing leg structure within said aligned vertical walls of the multi-level structure, said leg structure comprising at least one vertical rod embedded in the vertical wall of each module and extending substantially from the top to the bottom thereof, and a load bearing shim interposed between the opposing ends of the rods in adjacent modules to form therewith said continuous leg structure from top to bottom of said multi-level structure.

4,068,426
ANCHORING APPARATUS
Harley K. Warren, 9108 Fifth Ave. South, Bloomington, Minn. 55420
Filed May 3, 1976, Ser. No. 682,599
Int. Cl.[2] E04D *1/34*
U.S. Cl. 52—149 **7 Claims**



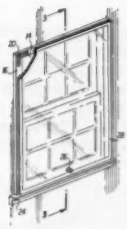
1. The method of anchoring to the ground a structure having an anchor strap which comprises the steps of
securing to the ground in line with said strap an anchor plate having an upstanding tongue with a stepped clamp at its upper end,
temporarily securing a winch having a drum to said tongue below said clamp,
feeding said strap through said clamp and clamping it to the drum of said winch,
tightening the strap by use of the winch and clamping it to the first step of said clamp,
releasing and removing the winch, and
folding the strap on itself and securing the folded end to the second step of said clamp.

4,068,427
WALL BRACING ASSEMBLY AND METHOD
Gaspare Camardo, 688 Euclid Ave., Elmhurst, Ill. 60126
Filed Sept. 23, 1976, Ser. No. 725,726
Int. Cl.[2] E04G *21/18, 21/22*
U.S. Cl. 52—127 **16 Claims**



1. An assembly for temporarily bracing a newly constructed masonry wall built upon a foundation, said assembly comprising: a vertically extending support member having a surface adapted to engage a face of said masonry wall; a bracing member having an upper end connected to an upper portion of said support member and extending downwardly and outwardly therefrom; a horizontally extending support plate adapted to removably extend through a bed joint in a masonry wall in overlying relationship with said foundation; said horizontally extending support plate including an upper surface which supportingly receives said vertically extending support member and a flange portion adapted to engage a vertical sidewall face on one of said foundation or said masonry wall which is oppositely disposed to the face of said masonry wall in engagement with said support member; and, means for resisting shifting of said foundation plate transversely to said wall.

4,068,428
INSULATION WINDOW
O. James Peterson, III, 2841 River Oaks Drive, Midlothian, Va. 23113
Filed Oct. 22, 1976, Ser. No. 735,221
Int. Cl.[2] E05C *21/02*
U.S. Cl. 52—202 **17 Claims**



1. An insulation window system comprising:
a transparent, rigid sheet of plastic to be mounted on internal, in situ, window frames of buildings, said sheet of plastic having an outer face, an inner face, and a margin about the edge thereof;
a fastening means including separable, mating, hook-and-loop fastening portions, a first portion of said hook-and-loop fastening portions including a plurality of elements, said elements each comprising a first attaching means for individually attaching said elements directly to the inner face of said sheet of plastic at spaced intervals about the margin thereof, a second portion of said hook-and-loop fastening portions including a plurality of elements, said elements each comprising a second attaching means for individually attaching said elements directly to said in situ window frames in spaced positions complementary to the positions of said elements of said first fastening portion; and,
a weather stripping including a third attaching means for attaching said weather stripping directly to the inner face of said sheet of plastic about the margin thereof to form a seal between said sheet of plastic and said in situ window frames when said rigid sheet of plastic is mounted on said window frames with complementary elements of said hook-and-loop fastening portions engaged.

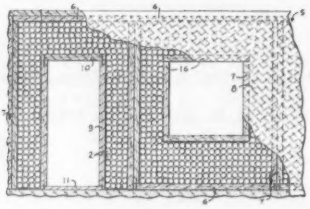
4,068,429
WALL AND WALL PART
Alvin Edward Moore, 8712 Manini Way, Diamondhead, Rte. 1, Bay St. Louis, Miss. 39520
Continuation-in-part of Ser. No. 569,922, April 21, 1975, and Ser. No. 599,681, July 28, 1975, said Ser. No. 569,922, is a continuation-in-part of Ser. No. 359,800, May 14, 1973, Pat. No. 3,878,661, which is a continuation of Ser. No. 102,317, Dec. 29, 1970, abandoned, said Ser. No. 599,681, is a continuation-in-part of Ser. No. 543,661, Jan. 24, 1975, Pat. No. 3,979,870. This application Feb. 25, 1977, Ser. No. 772,218
Int. Cl.[2] E04C *1/06*
U.S. Cl. 52—204 **16 Claims**

1. A wall, including a foundation, a plurality of can-comprising panels on said foundation, each adjacent pair of the panels having panel edges that are juxtaposed to each other, means

holding said edges in assembled relation, and wall-finishing material on one side of said panels; each of a plurality of said panels including:

a substantially planar can-supporting element on the side of said panel opposite from said wall-finishing material;

at least one panel-reinforcing bar, connected to said can-supporting element;



a plurality of cans on said can-supporting element, some of said cans being juxtaposed to said bar;

panel-reinforcing network on said cans;

means holding said network in place on said cans; and

a matrix comprising material of the type that sets into firm material from previously fluent condition, sheathing said cans, in contact with said planar element, and juxtaposed to said bar.

4,068,430

PREFABRICATED BOX-SHAPED STRUCTURAL SECTION

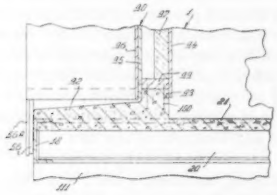
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 402,083, Oct. 1, 1973, abandoned, which is a continuation of Ser. No. 138,479, April 29, 1971, abandoned. This application Dec. 10, 1974, Ser. No. 531,376

Claims priority, application Netherlands, May 1, 1970, 7006497

Int. Cl.[2] **E04B** *5/29;* **E04C** *2/04*

U.S. Cl. 52—79.7 **9 Claims**



1. A prefabricated box-shaped structural section which comprises a concrete slab floor with a vertically disposed periphery, at last two upright walls, and a ceiling member, said floor comprising a concrete slab and horizontally disposed structural metal beams surrounding and connected with at least the greater part of said periphery of said concrete slab, said floor slab being provided with a rim which is elevated relative to the remainder of the slab and is spaced a relatively short distance inboard of said periphery and is substantially parallel therewith, said walls joining said rim at least in part, said upright walls having at least two upright beams secured to said metal beams of said floor with their outer facing sides flush with said vertically disposed periphery, wall sheets mounted on opposite inner and said outer facing sides of said upright beams so that the beams are situated between the wall sheets, said wall sheets mounted on said outer facing sides of said upright beams overlapping and contacting said vertically disposed periphery, said walls being composed of a non-concretitious material providing a density substantially less than concrete and including between sheets a non-concretitious insulating material, the upper ends of each of said upright beams being connected with longitudinal and transverse beams provided to form with said upright beams and said horizontal metal beams a parallelepiped frame structure, a ceiling member being connected to said longitudinal and transverse beams, said ceiling member being composed of light weight non-concretitious materials whereby the section has a relatively low center of gravity.

4,068,431

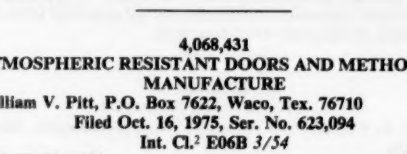
ATMOSPHERIC RESISTANT DOORS AND METHOD OF MANUFACTURE

William V. Pitt, P.O. Box 7622, Waco, Tex. 76710

Filed Oct. 16, 1975, Ser. No. 623,094

Int. Cl.[2] **E06B** *3/54*

U.S. Cl. 52—204 **8 Claims**



1. A door comprising a one-piece, integral, continuous stile and rail collar of an inwardly opening generally U-shaped cross-sectional configuration, said collar being constructed of reinforced plastic material resistant to corrosive and/or high humidity environments, said collar being defined by a bight portion and opposite faces, a plate secured to the exterior of each of said faces, said stile and rail collar and plates defining a completely sealed interior chamber, window means in said door, said window means being defined by a continuous annular wall integrally formed as a portion of a first of said plates projecting toward a second of said plates, an opening in said second plate defined by an inboard margin, said annular wall having an outwardly directed flange, and said inboard margin being secured to said outwardly directed flange.

4,068,432

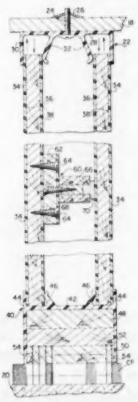
MOVABLE PARTITION WALL

Donald A. Davis, Winchester, Mass., assignor to The Schwamb Corporation, Arlington, Mass.

Filed July 30, 1976, Ser. No. 710,132

Int. Cl.[2] **E06B** *1/04*

U.S. Cl. 52—205 **19 Claims**



1. A demountable partition assembly comprising

a. an integrally formed ceiling runner rigidly attached to an upper supporting surface, said ceiling runner including a

base, a pair of downwardly extending outer legs, and a pair of outwardly and downwardly inclined inner legs, each outer leg and adjacent inner leg defining a space therebetween;

b. a pair of wall panels at either side of said partition assembly and forming the exposed wall surfaces thereof, the upper end of each panel being removably positioned in said ceiling runner, said panels being spaced and thereby providing a substantially open area therebetween for accommodating wiring, piping and the like;

c. a floor runner comprising a base, a pair of outer legs having upwardly and downwardly extending leg portions, and a pair of outwardly and upwardly inclined inner legs, the upper portion of each outer leg and the adjacent inner leg defining a space therebetween, said ceiling and floor runners being spaced so as to exceed in dimension the vertical dimension of said wall panels whereby said panels when installed can first be raised upwardly in said ceiling runner and thereafter lowered so that the bottom edges of said panels engage said base of said floor runner, and

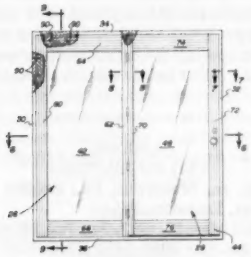
d. means for supporting and laterally stabilizing said floor runner and thus said partition wall from a supporting surface, said supporting means serving as the sole support for said partition assembly, said means for supporting and laterally stabilizing said floor runner and thus said partition walls comprising a leveling block disposed within the downwardly extending portions of said outer legs of said floor runner, and a floor strip positioned within said outer legs below said leveling block, said floor strip being spaced from the supporting surface for the partition assembly by nail means extending downwardly through said floor strip into engagement with said supporting surface, whereby said floor strip and thus said partition assembly can be installed over carpet without significant damage thereto, said downwardly extending portions of said outer legs of said floor runner terminating adjacent the upper surface of the carpet whereby said outer legs function as finish trim members.

4,068,433

WOOD-FRAME GLASS DOOR UNIT

J. Raymond Glover, Rt. 1 Box 336, Mt. Pleasant, Tex. 75455

Filed May 6, 1976, Ser. No. 683,718
Int. Cl.[2] E06B *1/04*; E04C *2/00*
U.S. Cl. 52—207 **21 Claims**



1. An entrance and exit wood frame glass door unit comprising:

a wood surround structure,

a first and second door panel each comprising a frame with a glass pane fitted therein, each said frame including laminated first and second side rails maintained in a spaced relation by laminated top and bottom rails attached between the first and second side rails, said lamination permitting the reduction of the width of said frame members and said first side rail of said second door panel and said second side rail of said first panel being on the order of one-half the width of said second side rail of said second panel and said first side rail of said first panel,

fastener means for rigidly mounting said first door panel to said surround structure,

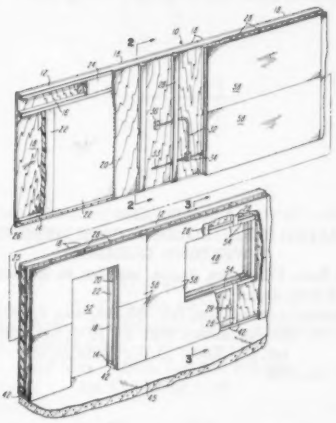
hinge means for hingedly connecting said first side rail of said second door panel to said second side rail of said first door panel whereby said second door panel hinges against said first door panel.

4,068,434

COMPOSITE WALL PANEL ASSEMBLY AND METHOD OF PRODUCTION

Stephen W. Day, 73 W. Alexandersville-Bellbrook Road, Dayton, Ohio 45459, and Daniel M. Hutcheson, 3855 Upper Bellbrook Road, Bellbrook, Ohio 45305

Filed Apr. 5, 1976, Ser. No. 673,383
Int. Cl.[2] E04B *5/48*
U.S. Cl. 52—220 **5 Claims**



1. A composite wall panel assembly adapted to simplify the construction of a building structure, comprising an inner facing of wood sheet material and an outer facing of wood sheet material disposed in parallel spaced relation, each said facing extending substantially continuously from the top of the wall panel assembly to the bottom of the assembly, a core of substantially rigid foam insulation material disposed between and contacting said inner and outer facings, a layer of adhesive bonding substantially the entire contacting surface of each said facing to the corresponding side of said core to form a laminated wall unit having a horizontal length greater than its vertical height, a plurality of horizontally spaced vertical wood furring strips positioned adjacent said inner facing and projecting inwardly towards the interior of the building structure, a layer of adhesive rigidly bonding substantially the entire contacting surface of each said furring strip to said inner facing, and said furring strips being adapted to receive inner sheeting material to form an interior wall surface for the building structure.

4,068,435

PRE-STRESSED TENSION RING STRUCTURES

Hollis C. Scott, Portland, Oreg., assignor to Unadilla Silo Company, Inc., Unadilla, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,015
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—223 R **11 Claims**

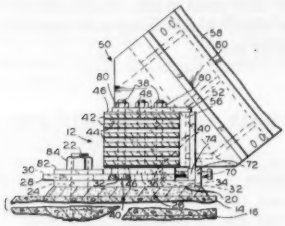
1. In a tension ring joint,

a bearing plate,

a connector plate slidable on the bearing plate,

connector bolts rigidly secured to the connector plate and adapted to connect the tension ring to the connector plate,

and adjustable thrust bolt means including a lug on the bearing plate, and a thrust bolt threadedly engaging the



lug and engaging the connector plate for moving the connector plate relative to the bearing plate.

4,068,436

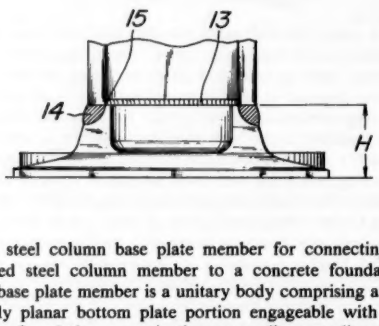
H-SHAPED STEEL COLUMN BASE MEMBER AND WELDING THEREOF

Kuniaki Sato, Hiratsuka, Japan, assignor to Kajima Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 385,166, Aug. 2, 1973, Pat. No. 4,048,776. This application Sept. 15, 1975, Ser. No. 613,347

Int. Cl.[2] E04G *25/00*; E02D *27/00*

U.S. Cl. 52—298 **4 Claims**



1. A steel column base plate member for connecting an H-shaped steel column member to a concrete foundation, which base plate member is a unitary body comprising a substantially planar bottom plate portion engageable with said concrete foundation, a projection upwardly extending from the planar bottom plate portion and having a top surface whose shape is substantially identical to cross sectional shape of the steel column member, a web part of a top surface of said projection in opposition to a web of said column member having a width broader than that of the said web of the column member so as to effect sufficient fillet welding therewith, J-shaped welding grooves formed along both edges of said top surface of said projection facing to lower ends of flanges of said column member extending from outer peripheries of the top surface of said projection so as to effect J-shaped groove welding between said lower ends of the flanges and the J-shaped welding grooves, a sloped top surface formed between said projection to said bottom plate portion so as to increase the thickness thereof as the planar bottom plate portion extends toward said projection, and abutments formed on the planar bottom portion in a sufficient thickness and having anchor bolt holes bored therethrough.

4,068,437

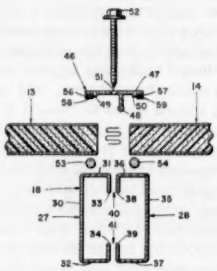
PANEL ROOF CONSTRUCTION WITH IMPROVED JOINTS

Morley Ben Byxbe, Holland; Richard Allan Meckley, Wyoming, and William Hunt Porter, West Olive, all of Mich., assignors to W. H. Porter, Inc., Holland, Mich.

Filed Nov. 4, 1976, Ser. No. 738,747

Int. Cl.[2] E06B *3/54*

U.S. Cl. 52—464 **15 Claims**



1. In a panel roof construction wherein each panel of said roof includes a sandwich type construction having a center insulating core, an outer skin and an under skin, said panels being supported on roof trusses to define longitudinal joints and transverse joints, the improvement comprising: said roof trusses defining an elongated slot extending along said longitudinal joints, the longitudinal edges of said panels being flush, each longitudinal joint including a cover strip extending therealong and having a general T-shape including an upper web straddling the adjacent edges of two panels and a stiffening member adapted to extend into the space between adjacent panels, the lower surface of said web defining a rib adjacent each edge thereof for spacing said web from said roof panels, first and second sealing strips for sealing the sides of said web respectively to adjacent panels, and threaded fastener means for securing said cover strip by threading into said slot of said roof truss at locations spaced along said longitudinal joint; and said transverse joints including a groove at the lower edge of each panel formed by extending the outer and under skins thereof to form upper and lower laps, a strip of flexible sealing material secured to the under surface of said upper lap, the upper edge of lower panels being sized to be received into the groove of an upper panel, said flexible sealing strip acting as a seal in itself and spacing the lap of an upper panel above the outer surface of a lower panel or break the capillary therebetween.

4,068,438

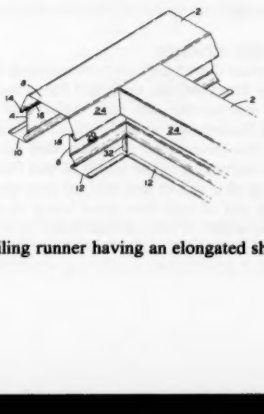
CEILING RUNNER

Ernest B. Nute, Jr., Mountville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 23, 1977, Ser. No. 780,418

Int. Cl.[2] E04B *5/52*; E04C *3/32*

U.S. Cl. 52—488 **2 Claims**



1. In a ceiling runner having an elongated sheet metal body

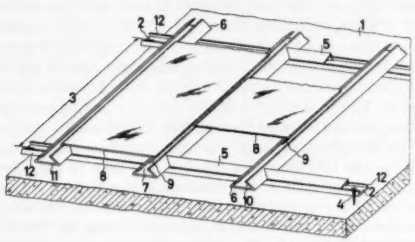
with a generally inverted U-shaped configuration, said runner having two side walls connected together at their one ends with a flat top member, the opposite sides of the side walls having horizontal flanges which extend outwardly from the body of the runner to support ceiling boards on either side of the runner, said side walls having a first groove means therein, said first groove means being in the mid region of the side walls and extending outwardly from the side walls to form two parallel ledges inside the U-shaped body configuration, said grooves extending below and outwardly of the parallel ledges, and a second groove means in the side walls closely positioned to the horizontal flanges forming a stop means extending outwardly from the side walls of the runner adjacent said horizontal flanges.

4,068,439

WALL COVERING

Heinz-Erhardt Andersen, Burgkirchen, Alz, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 20, 1976, Ser. No. 724,542
Claims priority, application Germany, Sept. 24, 1975, 2542526
Int. Cl.[2] E04B 5/52
U.S. Cl. 52—497 **4 Claims**



1. A wall covering system of plastic elements consisting of panels having lateral edges folded by an angle of more than 90°;

profiles having a dovetail cross section for holding the panels;

structural shapes having a dovetail cross section, said structural shapes are fastened in parallel position on the wall; and

spacers having V-shaped cross section with such chamfered end faces that their inclination degree corresponds to the inclination of the lateral faces of the profiles and having a length which corresponds to that of the panels, said spacers are fitted into the structural shapes in which they are sliding in longitudinal direction and fix the profiles on the structural shapes, whereby the folded edges of said panels constitute together with said profiles a form-closed fitting.

4,068,440

FRAMING JOINT CONSTRUCTION AND CLIP THEREFOR

Ben W. Lillethorup, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 24, 1976, Ser. No. 689,111
Int. Cl.[2] E04H 12/00; E04D 1/34
U.S. Cl. 52—301 **12 Claims**

1. A framing joint construction intended to be readily assembled comprising

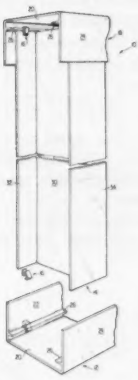
a. a base member having a foundation-engaging surface and at least one vertically extending wall-defining member extending upwardly therefrom,

b. means defining a horizontal support surface vertically spaced from said foundation-engaging surface,

c. clip means attached to said means defining a horizontal support surface,

1. said clip means including a U-shaped section providing a vertically extending upwardly open channel,

d. a vertically extending stud member received in said U-shaped section of said clip means,



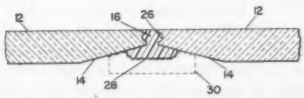
e. and a cover member attached to said vertically extending stud member at the top thereof.

4,068,441

CUT GLASS PANEL

B. Jeremiah Shaffer, Worthington, Ohio, assignor to Pease Company, Fairfield, Ohio

Filed May 7, 1975, Ser. No. 575,419
Int. Cl.[2] E04B 5/46
U.S. Cl. 52—308 **1 Claim**



1. A decorative self-supporting cut glass panel adapted to be mounted with its periphery encompassed in a frame in a window, door, or the like, comprising, in combination,

a. a plurality of pieces of light-transmitting sheet glass bonded together in coplanar relation forming a self-supporting and light-transmitting panel having a decorative side and a reverse side,

b. the peripheral edges of each of said glass pieces which are adjacent others of said pieces in said panel being cut to approximately the mirror image of said adjacent pieces and being arranged with spaces of approximately uniform width between adjacent said pieces,

c. adhesive material filling said spaces between adjacent said pieces of glass,

d. said adhesive being a mixture of organic materials and inorganic filler,

e. said filler having a coefficient of thermal expansion closely approximating that of said glass pieces and being selected from the group consisting of finely ground glass, magnesium oxide and calcium carbonate,

f. said mixture of organic materials comprising an epoxy resin and a curing agent,

g. said adjacent edges of said glass pieces being beveled on said decorative side of said panel,

h. said bevel being at an angle in the range of 5° to 17° from the plane of said decorative side of said panel and having a width of the order of $\frac{1}{8}$ inch,

i. the edges of said glass pieces facing each other having structurally irregular surfaces providing better bonding engagement with said adhesive material,

j. said adhesive material extending through said panel between adjacent pieces of glass and having a generally T-shaped cross-section including a head portion overlying the adjacent surface portions of said bevels but retained within the plane of said decorative surface, and

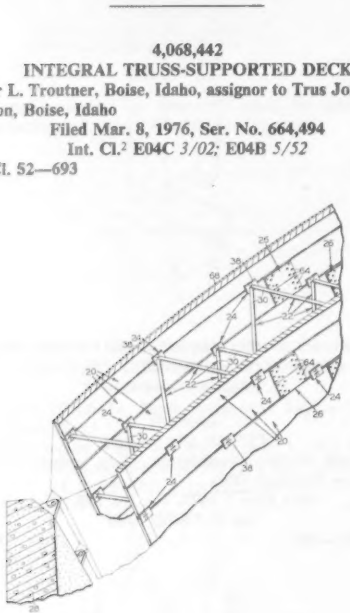
k. the end of said T-shaped section opposite said head portion being flush with said reverse side of said panel.

4,068,442

INTEGRAL TRUSS-SUPPORTED DECK

Arthur L. Troutner, Boise, Idaho, assignor to Trus Joist Corporation, Boise, Idaho

Filed Mar. 8, 1976, Ser. No. 664,494
Int. Cl.² E04C 3/02; E04B 5/52
U.S. Cl. 52—693 **4 Claims**



1. An integral, truss-supported deck comprising:

a. outer and inner spaced chords each comprising at least one pair of substantially coplanar planks arranged with their side edges adjacent,

b. a plurality of truss web members arranged zig-zag between the chords,

c. a plurality of side connectors positioned in longitudinally spaced relation along the adjacent side edges of each plank pair,

d. each side connector comprising a pair of back-to-back angle irons disposed with their backs in spaced relationship, said angle irons being connected to each other at their ends and thereby defining a recess between the spaced backs of said angle irons, the backs of the angle irons being provided with a pair of aligned openings, the adjacent ends of each pair of web members being flat and perforate and inserted in lapped relation into the recess with the perforations in the web member ends aligned with the openings through the angle iron backs, the laterally extending portions of the angle irons comprising lateral projections engaging the adjacent planks,

e. a plurality of first fasteners comprising pin means inserted through all of said openings and perforations fastening the adjacent ends of adjacent web members to the adjacent side connectors, thereby connecting the web members to the side connectors, and

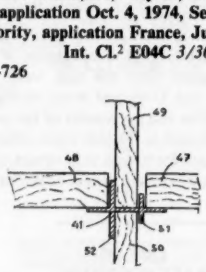
f. a plurality of second fasteners fastening the lateral projections of each side connector to the adjacent planks, thereby connecting the planks to each other.

4,068,443

SECTION PIECE FOR T-SECTION ASSEMBLY

Jean Stoltz, rue de l'Eglise, 77 Ury, France

Division of Ser. No. 365,097, May 30, 1973, Pat. No. 3,920,345.
This application Oct. 4, 1974, Ser. No. 512,142
Claims priority, application France, June 1, 1972, 72.19650
Int. Cl.² E04C 3/30
U.S. Cl. 52—726 **3 Claims**



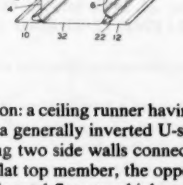
1. An assembly element and section piece comprising a parallelpiped with respective pairs of first, second and third endfaces, two first slots, each first slot opening lengthwise into one of the first endfaces across at least a substantial portion of one dimension thereof, a section piece including an elongated member with one side being adapted to abut said first endface, a blade portion projecting from said one side of the member, each first slot having a depth sufficient to receive and accommodate the blade portion of said section piece, one of the first slots including an inner surface shaped and adapted to form a mating portion to mate with the cooperating mating portion of the blade portion inserted therein, four first threaded openings in the parallelpiped, each first opening extending therethrough parallel to the first slots and opening into both of the second endfaces thereof each of the openings being located between one of the first slots and one of the third endfaces, two second slots extending perpendicular to and intersecting the first slots, each second slot opening lengthwise into one of the first endfaces of the parallelpiped across the entire dimension thereof and into the third endfaces a distance corresponding to its depth, the second slots having a depth sufficient to receive and accommodate additional section pieces, two second threaded openings opening into one of the third endfaces and extending through the parallelpiped and opening into the surface of the first slot opposite the surface that includes the mating portion, the second openings being located on opposite sides of the second slot which intersects the first slot that includes the surface with the mating portion.

4,068,444

CEILING RUNNER WITH CLOSURE STRIP

James C. Ollinger, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 2, 1977, Ser. No. 792,897
Int. Cl.² E04C 3/32
U.S. Cl. 52—731 **6 Claims**



1. In combination: a ceiling runner having an elongated sheet metal body with a generally inverted U-shaped configuration, said runner having two side walls connected together at their one ends with a flat top member, the opposite sides of the side walls having horizontal flanges which extend outwardly from the body of the runner to support ceiling boards on either side of the runner, said side walls having a groove means in the side

walls closely positioned to the horizontal flanges forming a projection extending outwardly from the side walls of the runner adjacent said horizontal flanges; and, a closure strip means having a flat elongated body portion and flanges on the sides of the body portion, said flanges being in the form of two offset leg means positioned on one side of the plane containing the body portion, said closure strip means being sized to have its flanges positioned in said groove means and, at the same time, partly conform in shape to the flat top member and part of the side walls of the runner.

4,068,445

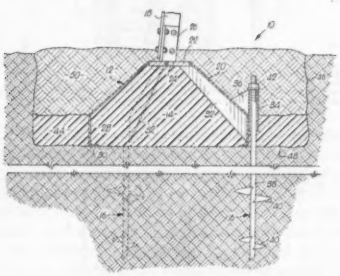
LIGHTWEIGHT, SCREW ANCHOR SUPPORTED FOUNDATION AND METHOD OF INSTALLING SAME

Donald E. Bobbitt, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Continuation-in-part of Ser. No. 550,753, Feb. 18, 1975, abandoned. This application Feb. 23, 1976, Ser. No. 660,434

Int. Cl.[2] E04D *15/00;* **E02D** *27/00*

U.S. Cl. 52—743 **6 Claims**



1. A method of installing a foundation comprising the steps of:

driving a plurality of spaced earth anchors into the earth at a selected foundation site, each of said anchors including an elongated shaft and a generally transversely extending load-bearing member adjacent the lower embedded end of the shaft;

positioning force-spreading structure adjacent said anchors with the base thereof contacting the earth and presenting a first effective area; and

tensionally coupling said earth anchors and force-spreading structure in a manner to pull said base and load-bearing members in opposition to each other for creating a pre-stressed bulb of soil between the base and load-bearing members,

the greatest effective horizontal cross-sectional area of said bulb of soil being greater than said first effective area of said base for spreading compressive and tensile loads imposed on said foundation in order to increase the holding power of said foundation,

said coupling including the steps of successively pulling said base and load-bearing members in opposition to each other a plurality of times at desired intervals for creating said bulb of soil.

4,068,446

MOVING WORK STATION FOR USE IN CONSTRUCTING A BUILDING ROOF

Ralph H. Brueske, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Dec. 30, 1976, Ser. No. 755,848

Int. Cl.[2] E04B *1/00;* **E04G** *21/00*

U.S. Cl. 52—747 **24 Claims**

21. A method of constructing a roof, including the steps of:

providing a moving work station;

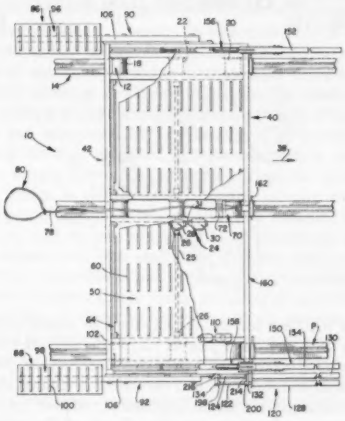
locating roofing materials on top of the roof;

moving working materials onto the work station;

moving the work station to a work location;

positioning insulation on top of the roof purlins;

maintaining the insulation in a taut configuration;



locating a roof panel on top of the taut insulation;

securing the roof panel to the roof purlins; and

moving the work station to the next location.

4,068,447

METHOD AND AN APPARATUS FOR PREPARING A PLATFORM FOR BOTTOM CASTING

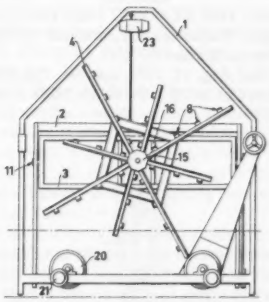
Curt Jerling, Sundbyberg; Hans Olsson, Stockholm, and Torgny Veiback, Bandhagen, all of Sweden, assignors to Norbergs Mekaniska Verkstads AB, Norberg, Sweden

Filed Apr. 30, 1976, Ser. No. 681,930

Claims priority, application Sweden, May 6, 1975, 7505278

Int. Cl.[2] E04G *21/00*

U.S. Cl. 52—749 **16 Claims**



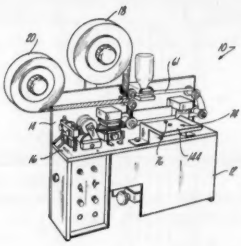
1. A bricklaying apparatus for preparing a platform having channel means therein for bottom casting, characterized in that it comprises a supporting frame, a loading member pivotally suspended therein and having arm structures capable of holding bricks forming rows by means of securing and clamping members, means for tilting and lowering or raising the loading member into or away from a horizontal position wherein the bricks are received by said channel means, and means for suspending the action of said securing and clamping members.

4,068,448

SMALL ARTICLE PACKAGING APPARATUS

Marvin O. Modeen, Columbus, Ohio, assignor to IN-Pac Corporation, Columbus, Ohio

Filed Aug. 9, 1976, Ser. No. 712,687
Int. Cl.[2] B65B *5/02, 11/50, 61/26*
U.S. Cl. 53—131 **5 Claims**



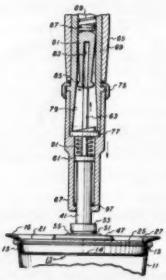
1. In a machine for packaging items in sealed pockets of packages formed from a pair of strips of packaging material; means defining a continuous path of movement for one of the strips first in one direction and thereafter in a direction opposite said one direction, means disposed in the path for intermittently printing a label on one side of one of the strips when disposed for movement in said one direction, means located in the path for intermittently indenting said one strip at an opposite side thereof when disposed for movement in said opposite direction, said indenting means including a recessed punch member cooperating with an opposing die member for cold pressing spaced indentations in said one strip, means for directing the other of said strips in flat form to overlie said indented strip after the items to be packaged are loaded in said indentations, means adjacent said directing means for intermittently heat sealing said strips together along the periphery of said indentations to provide a strip of sealed packages, said sealing means including a heated platen cooperating with an opposing heat sink member, means for intermittently advancing said strip of packages along said path, and means for intermittently cutting said strip of packages between said indentations, said cutting means including a bearing block cooperating with an opposing blade member, said punch member, platen and bearing block being mounted for reciprocating movement into contact with their respective opposing members.

4,068,449

TOOL FOR PLACING LIDS ON CUPS

Paul W. Harper, Rochester, N.Y., assignor to Our Mother of Sorrows Church, Rochester, N.Y.

Filed Aug. 17, 1976, Ser. No. 715,937
Int. Cl.[2] B67B *1/04, 5/02;* **B65B** *7/28*
U.S. Cl. 53—319 **10 Claims**



1. A tool for applying a lid to a cup, said lid having an upstanding marginal flange shaped for a sealed fit against the inside of said cup, and said tool comprising:

a. a shoe for engaging said lid within said flange;

b. resilient means projecting radially outward from said shoe for engaging the inside of said upstanding flange to retain said lid on said shoe;

c. a shank connected to and rising from said shoe;

d. a handle arranged to be vertically movable relative to said shank and said shoe;

e. spring means operatively connected between said handle and said shank for applying a predetermined maximum downward pressure to said shoe in response to downward movement of said handle relative to said shoe during application of said lid to said cup; and

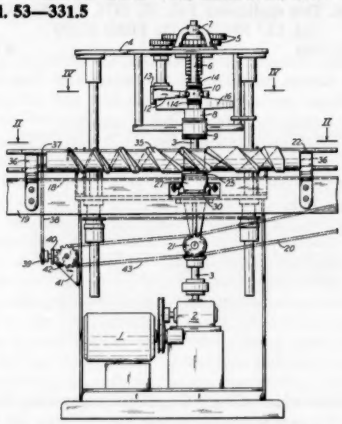
f. means for signalling to the user of said tool that said predetermined maximum pressure has been reached and said lid is properly seated in said cup.

4,068,450

CONTAINER CAPPING MACHINE

William M. Easter, Pittsburgh, Pa., assignor to Horix Manufacturing Company, McKees Rocks, Pa.

Filed Nov. 17, 1976, Ser. No. 742,416
Int. Cl.[2] B65B *7/28;* **B67B** *3/08, 3/20*
U.S. Cl. 53—331.5 **1 Claim**



1. A container capping machine comprising a vertically reciprocable rotary chuck for holding a screw cap in its lower end while it screws the cap onto a container below it, a continuously moving horizontal conveyor spaced below the chuck, a continuously rotating horizontal positioning screw extending along one side of the conveyor and past said chuck and provided with a helical trough in a position to receive containers on the conveyor and control their forward movement, the portion of said trough beside said chuck having side walls extending part way around the screw in radial planes of the screw to stop temporarily the forward movement of a container in the trough when it reaches a position below said chuck for receiving a cap therefrom, a pair of jaws movable toward and away from each other across the top of said conveyor, means synchronized with the rotation of said positioning screw for moving the jaws toward each other to grip a stopped container between them after it enters between said radial side walls of the screw trough, means for moving said rotary chuck down and up while said jaws are gripping a container below it in said cap-receiving position, and means for moving said jaws away from each other while a capped container is still between said radial side walls, the pitch of said screw trough being such that the screw accelerates containers as they approach said jaws and accelerates them again as they leave the jaws to bring them up to substantially the speed of said conveyor.

4,068,451

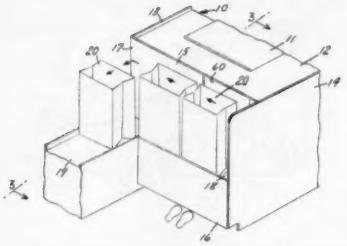
PAPER BAG OPENING DEVICE

Richard A. Bewerse, Rte. 3, Box 601, Meritt Island, Fla. 32952, and Stanley Joseloff, 185 S. Atlantic Ave., Cocoa Beach, Fla. 32931

Filed Mar. 31, 1977, Ser. No. 783,275
Int. Cl.[2] B31B *1/76*
U.S. Cl. 53—385 **4 Claims**

1. An improved folded paper bag opening device comprising: support means supporting a stack of folded bags in sub-

stantially horizontal orientation; an elongated bag-handling arm having a first end pivoted for rotation about a horizontal axis above said support means, said bag-handling arm having associated bag clamping means on a second end thereof; a bag-opening arm having a first end pivotally mounted for rotation about an axis parallel to that of said bag-handling arm, and having clamping means on a free opposite end thereof, said bag-opening arm being shorter in length than said bag-handling arm; means for cyclically moving said bag-handling arm between horizontal and vertical positions, and for opening and closing said associated clamping means when said bag-handling arm is at said horizontal and vertical positions; low velocity air current supply means positioned adjacent said stack



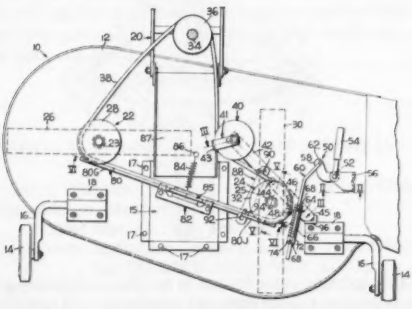
supporting means to apply a current of air serially to the opened ends of said folded bags in said stack; said bag-handling arm progressively lowering to position its associated clamping means adjacent an open end of an uppermost bag in said stack to contact said bag under the influence of said air current supply means, and close said clamp means thereon; said bag-handling arm thereafter elevating to vertical position; said bag-opening arm subsequently pivoting downwardly beneath a lower closed edge of said engaged bag, and subsequently upwardly to engage a free edge of a bottom wall of said bag with its associated clamping means, and thereafter downwardly, to move said bottom wall to a horizontal plane and fully open said bag.

4,068,452

MOWER SPINDLE AND SPINDLE DRIVE BELT BRAKING ARRANGEMENT FOR ROTARY MOWER HAVING PLURALITY OF MOWER SPINDLES

Daniel W. Schaefer, and Kenneth H. Klas, both of Port Washington, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 11, 1976, Ser. No. 666,046
Int. Cl.[2] A01D *69/08, 69/10*
U.S. Cl. 56—11.6 **14 Claims**



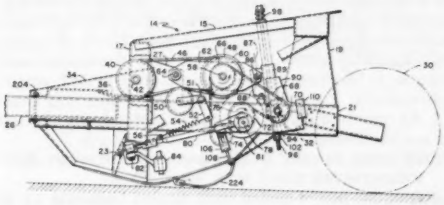
1. A rotary mower comprising a mower deck, a pair of arbors mounted on said deck in spaced-apart relation to each other, a spindle supported for rotation by each of said arbors, a mower blade mounted on each of said spindles for rotation with the respective spindle in a plane beneath said mower deck, a driven pulley fixed to each spindle above said mower deck, a drive belt driven from a suitable drive source, each of said driven pulleys being adapted to have said drive belt trained therearound, an idler pulley support arm supported for movement by said mower deck, an idler pulley carried by said idler pulley support arm, a clutch lever means carried by said mower and operatively associated with said idler pulley support arm, said clutch lever means being selectively movable to move said idler pulley support arm to one or the other of two alternative positions, whereby to selectively move said idler pulley into either tensioning or nontensioning relation to said drive belt and thus whereby to cause said drive belt to be selectively either in driving or in non-driving relation to said driven pulleys, a brake member common to both of said driven pulleys and supported by said mower in proximity to and extending between both of said driven pulleys, said brake member having contiguous each of its opposite ends a brake portion which is engageable in braking relation to a corresponding one of said driven pulleys, and control link means carried by said mower and operatively associating said idler pulley support arm with said brake member, said control link means being movable in accordance with movements of said idler pulley support arm to one or the other of said two alternative positions whereby to determine by its position whether said brake member is selectively in either nonbraking relation or in braking relation to both of said driven pulleys in accordance with whether said idler pulley is respectively in said tensioning relation or in said nontensioning relation to said drive belt.

4,068,453

DRIVE SYSTEM FOR HAY HARVESTING AND CONDITIONING MACHINE

Amos Hill, Newton, Kans.; Warner M. Heckley, Rockford, and Gerald F. Richards, Celina, both of Ohio, assignors to Avco Corporation, Coldwater, Ohio

Filed June 28, 1976, Ser. No. 700,328
Int. Cl.[2] A01D *45/00*
U.S. Cl. 56—14.4 **7 Claims**



1. A crop harvesting and conditioning machine of the type adapted to be drawn by a tractor having a power take-off, comprising:

a transversely arranged header assembly including a main frame, rearwardly positioned support wheels, and a sickle mower positioned along the front of said frame;

a tongue subframe, a pivotal mount between said subframe and one end of said main frame sidewalls and having at its other end a drawbar coupling having provision for attachment to said tractor;

a pair of crop conditioning rolls rotatably mounted relative to said main frame on generally transverse axes above and behind said mower, each roll having a shaft extending axially outward therefrom, said shafts allowing rotatable journalling of said rolls to said machine;

lever arm plates swingably mounted on the sidewalls of the main frame, the lower of said rolls being journaled on a fixed axis relative to said main frame and the upper of said rolls being journaled at its ends on said lever arm plates;

spring means adjacent each end of said upper crop conditioning roll for exerting a compressive force urging the crop conditioning rolls together, one end of each of said spring means being anchored to said frame, the other end of each of said spring means being attached to the swingable end of one of said lever arm plates;

a transmission mounted on said subframe and coupled to said

power take-off, said transmission including an output element having an axis coaxial with said pivot;

belt drive means for transferring power from said output element to said upper crop conditioning roll, said belt drive means including a pulley attached to the axially extending shaft on the end of said upper crop conditioning roll; and

an arrangement of means for utilizing said upper crop conditioning roll to drive said lower crop conditioning roll, said arrangement of means comprising:

a driving sprocket on the outward extending shaft of said upper crop conditioning roll,

a driven sprocket on the outward extending shaft of said lower crop conditioning roll,

a yieldably restricted slide element attached to one of said spring means and moving in synchronism with any displacement of the companion lever arm plate,

a plurality of chain positioning elements of which one is rotatably mounted on said slide element, and

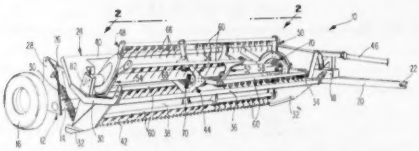
an endless chain entrained around said sprockets and chain positioning elements, said one chain positioning element being both within the chain periphery and secured to said slide to move linearly to compensate for sprocket chain slack variation introduced as said crop conditioning rolls are separated in response to varying amounts of crop material passing therebetween.

4,068,454

CROP GATHERING REEL ASSEMBLY

Bryant F. Webb, Ephrata, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 30, 1976, Ser. No. 718,639
Int. Cl.[2] A01D *57/02*
U.S. Cl. 56—220 **9 Claims**



1. An improved crop gathering reel assembly for a harvesting machine, comprising:

shaft means mounted to said machine for rotation about a transverse axis;

at least one pair of spaced apart support members;

a plurality of crop-engaging members extending between and interconnecting the peripheries of said support members;

means mounting each of said support members to said shaft means for universal articulation relative to said shaft means; and

means mounted to said machine for positioning said support members in generally parallel planes disposed at predetermined oblique angles relative to said transverse rotational axis of said shaft means such that, upon predetermined rotation of said shaft means, said support means rotate therewith within said planes and concurrently universally articulate relative thereto so that said crop-engaging members interconnecting said support members will engage and sweep crop rearwardly and laterally to said harvesting machine.

4,068,455

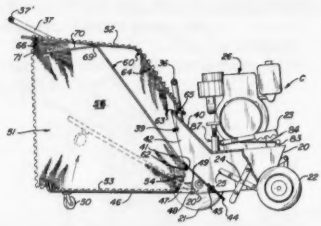
BAG FOR A LAWN COMBER

Claude D. Zehrung, Jr., Lakewood; Clarence L. Urie, and Joseph C. Martinez, both of Denver, all of Colo., assignors to Bluebird International, Inc., Englewood, Colo.

Filed Feb. 17, 1976, Ser. No. 658,420
Int. Cl.[2] A01D *43/02*
U.S. Cl. 56—344 **9 Claims**

1. In combination with a lawn comber, or the like, having a rearward discharge chute wherethrough debris is discharged with the exit portion of the discharge chute being a generally rectangular opening formed by an upper plate, a lower plate and sidewall plates, a debris bag attached to said exit portion to extend rearwardly therefrom to receive debris, and comprising:

a. a body of pliable, cloth-like sheet material having a generally rectangular bottom disposed near the ground surface below the exit portion of the discharge chute, a front wall extending upwardly from the front edge of the bottom and to said lower plate, side walls extending upwardly from the respective side edges of the bottom to a top edge portion above the top of the discharge chute with the



front edges of the side walls at the adjacent sides of said sidewall plates and a rear wall extending upwardly from the rear edge of the bottom to the top edges of the sidewalls to complete the bag form, and

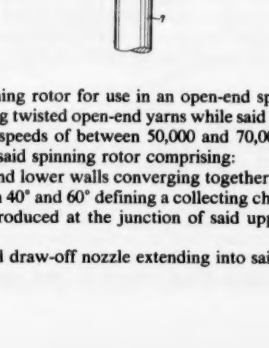
b. a bag frame including an upright section attached to the exit portion of the discharge chute and a bag supporting section having rearwardly extended longitudinal top rods connected by a rear transverse cross rod, corresponding with the bag form, being cantilevered from the top of the upright section and being connected with the top edge portions of the sidewalls and rear wall of the bag body to suspend the bag body in an open debris-receiving position.

4,068,456

OPEN-END SPINNING DEVICE

Hans Landwehrkamp, Lenting, Germany, assignor to Schubert & Salzer, Ingolstadt, Germany

Filed Sept. 27, 1976, Ser. No. 726,805
Claims priority, application Germany, Oct. 4, 1975, 2544503
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 **3 Claims**



1. A spinning rotor for use in an open-end spinning device for producing twisted open-end yarns while said spinning rotor is driven at speeds of between 50,000 and 70,000 revolutions per minute, said spinning rotor comprising:

a. upper and lower walls converging together at an angle of between 40° and 60° defining a collecting channel for yarn being produced at the junction of said upper and lower wall,

b. a thread draw-off nozzle extending into said rotor,

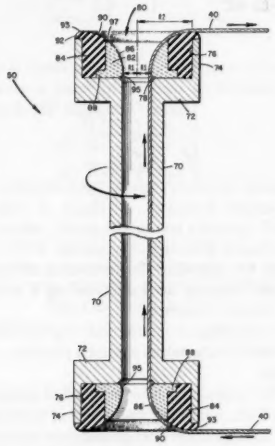
c. a bore extending through said thread draw-off nozzle, and
d. a thread contact surface surrounding a lower end of said bore over which yarn being produced in said rotor passes to exit through said draw-off nozzle,
e. said thread contact surface having a radius of curvature between 7.5 and 8.5 mm.

4,068,457

BI-COMPONENT FRICTION DISC FOR YARN TEXTURING

John W. Glaze, Jr., Charlotte, and Billy Mac Graves, Graham, both of N.C., assignors to Intech Corporation, Charlotte, N.C.

Filed July 13, 1976, Ser. No. 704,957
Int. Cl.[2] D01H *7/92*
U.S. Cl. 57—77.4 **7 Claims**



1. A rotatable friction disc for imparting twist to a yarn comprising an annular flared friction surface symmetrically disposed about an axis of rotation and terminating at one end in a minor radius defining an opening and at the other end in a major radius, said friction surface defining in cross-section a substantially smooth curve and having a first surface portion extending from said minor radius to a point intermediate said radii and a second surface portion extending from said intermediate radius to said major radius, said first surface portion being of a ceramic-like material having a relatively low coefficient of friction with said yarn and said second surface portion being of a rubber-like material having a relatively high coefficient of friction with said yarn.

4,068,458

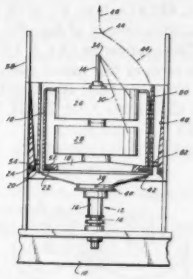
BALLOON SUPPRESSOR FOR LIGHT AND HEAVY YARNS

Aloys Greive, Munster, Germany, assignor to Hamel GmbH Zwirnmaschinen, Munster, Germany

Filed Sept. 17, 1976, Ser. No. 724,461
Claims priority, application Germany, Sept. 17, 1975, 2541493
Int. Cl.[2] D01H *1/10, 1/42*
U.S. Cl. 57—108 **11 Claims**

1. In a twisting apparatus wherein a yarn package is supported on a rotatably supported holder in a laterally closed but upwardly open space defined between a plurality of upright walls defining at least adjacent their bases a circle, and wherein coacting magnets on said holder and at least one of said walls at the base thereof prevent rotation of said holder, the improvement comprising:

a balloon-limiting sleeve of generally cylindrical shape receivable between said holder and said walls, and



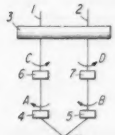
an elastic ring on the exterior of said sleeve snugly engaging said walls for releasably securing said sleeve in said space on said walls for easy removal therefrom.

4,068,459

METHOD OF TWIST-PLYING A FIBROUS PRODUCT

Pavel Mikhailovich Movshovich, Pechatnikov pereulok, 3, kv. 8; Gennady Konstantinovich Maximov, Kaspiiskaya ulitsa, 20, korpus 3, kv. 137, both of Moscow; Viktor Pavlovich Khavkin, ulitsa Vatutina, 11, kv. 4, Moskovskaya oblast, Khimki; Lev Nikolaevich Ivanov, Kotelnicheskaya naberezhnaya, 25/8, kv. 74, Moscow; Natalya Borisovna Babushkina, Chasovaya ulitsa, 5b, kv. 15, Moscow; Vladimir Konstantinovich Afanasiev, Galyanovsky proezd, 4[a], kv. 219, Moscow; Tamara Nikolaevna Kudryavtseva, Davydkovskaya ulitsa, 6, kv. 5, Moscow, and Sergei Vladimirovich Nezelenov, Kineshemskoe shosse, 8[a], kv. 6, Kostroma, all of U.S.S.R.

Filed June 25, 1976, Ser. No. 699,935
Claims priority, application U.S.S.R., July 22, 1975, 2158695
Int. Cl.[2] D02G *3/26;* **D01H** *7/90*
U.S. Cl. 57—156 **10 Claims**

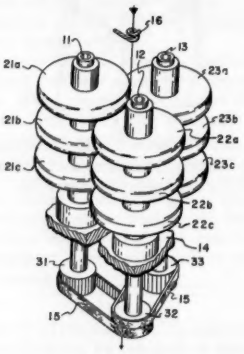


1. A method of twist-plying a fibrous product, comprising the steps of continuously feeding at least two fibrous ribbons; applying to each continuously fed fibrous ribbon a pulsating torque of an invariable direction, created by a vortex of air; simultaneously with said pulsating torque subjecting each fibrous ribbon constantly to an additional torque the direction of which is opposite to that of the pulsating torque and the amount of which is less than that of the pulsating torque, whereby each fibrous ribbon is caused to acquire a sign-variable twist; and then joining said fibrous ribbons together so that, while untwisting on each other, they are caused to interlace, thereby forming a finished product; and then winding the finished product onto a bobbin.

4,068,460
YARN PROCESS

Melvyn Robert Fischbach, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 632,873, Nov. 17, 1975, Pat. No. 4,012,896, which is a continuation-in-part of Ser. No. 445,718, Feb. 25, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 729,577
The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.
Int. Cl.[2] D02G *1/04;* D01H *7/92*
U.S. Cl. 57—157 TS 19 Claims

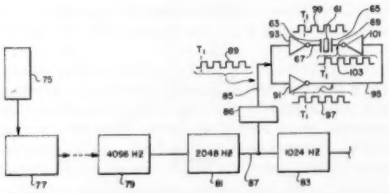


1. In a process for producing false twist crimped multifilament yarn, wherein yarn is fed over the outer periphery of a rotating disc, the improvement comprising causing said yarn traveling at running speeds of at least 1000 feet per minute to pass over a disc, the yarn contacting surface of which is inorganic with a hardness of greater than 975 on the $Knoop_{100}$ scale, and a surface texture of more than 75 and less than 400 peaks of at least 50 microinches in height per linear inch.

4,068,461
DIGITAL ELECTRONIC ALARM WATCH

John R. Fassett, Irvine; Ivan V. Rondas, Mission Viejo; Joseph P. George, Huntington Beach, and Claus Sondermann, Orange, all of Calif., assignors to Frontier Inc., Newport Beach, Calif.

Filed Apr. 15, 1976, Ser. No. 677,192
Int. Cl.[2] G04B *19/30*
U.S. Cl. 58—23 R 10 Claims

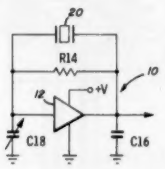


1. A method of driving a piezoelectric, audible tone producing crystal of a wristwatch, comprising:
producing an audio frequency signal, said producing step comprising:
generating in a crystal controlled oscillator the fundamental time base signal for said wristwatch;
dividing said fundamental time base signal by a factor which produces an audio frequency signal; and
utilizing said audio frequency signal for driving the time keeping functions of said wristwatch and for driving said audible tone producing crystal; and
noninductively applying said signal to said crystal to induce an alternating polarity potential to said crystal, said applying step comprising:
inverting said audio frequency signal to produce an inverted audio frequency signal;
conducting said audio frequency signal to a first terminal of said piezoelectric crystal; and
conducting said inverted audio frequency signal to a second terminal of said piezoelectric crystal.

4,068,462
FREQUENCY ADJUSTMENT CIRCUIT

Donald R. Duff, Mountain View; James O. Lamb, and Donald E. Pezzolo, both of Cupertino, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 17, 1976, Ser. No. 687,053
Int. Cl.[2] G04C *3/00;* H03F *1/00*
U.S. Cl. 58—23 AC 8 Claims



1. A circuit for adjusting the frequency of operation of an electronic time keeping device including a source of clock pulses, said circuit comprising:
a. means for storing a numeric code representative of a time delay of said clock pulses having a plurality of data output terminals;
b. means for counting a time interval in proportion to said numeric code, including a plurality of data input terminals coupled to respective ones of said data output terminals of said means for storing, a plurality of data output terminals, and a clock input terminal;
c. circuit means having a first input coupled to the source of clock pulses, a first clock output terminal coupled to the clock input terminal of said means for counting, a plurality of data input terminals coupled to respective ones of said data output terminals of said means for counting and a second clock output terminal disposed for supplying clock pulses of an adjusted frequency to the electronic time keeping device.

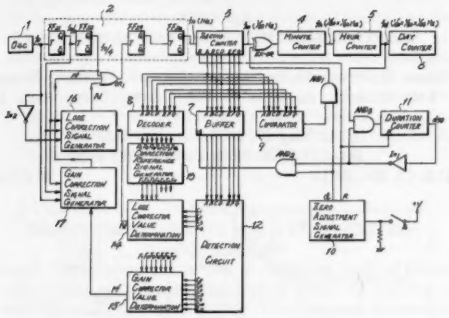
4,068,463
REFERENCE SIGNAL FREQUENCY CORRECTION IN AN ELECTRONIC TIMEPIECE

Hidetoshi Maeda, Tenri, and Takehiko Sasaki, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1975, Ser. No. 641,822
Claims priority, application Japan, Dec. 17, 1974, 49-145232; June 23, 1975, 50-77735
Int. Cl.[2] G04C *23/00;* H03K *21/32;* H03B *3/04*
U.S. Cl. 58—23 AC 8 Claims

1. In an electronic timepiece which comprises a base signal generator, a frequency divider for developing a reference signal, a time information calculation circuit responding to the reference signal, a display system for displaying the time information, a zero adjustment switch and a zero adjustment control circuit associated with the zero adjustment switch, the improvement comprising:
a. a detection circuit for developing detection signals in accordance with second information in the time informa-

tion calculation circuit when the zero adjustment switch is closed; and



b. a correction signal generator for correcting the frequency of the reference signal in response to the detection signals derived from the detection circuit.

4,068,464

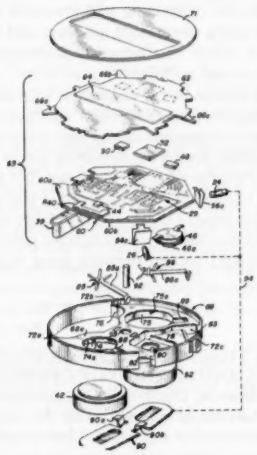
SHOCK RESISTANT WRISTWATCH MODULE

James V. Barnett, II, Cupertino; Ernest F. Mayer, Palo Alto; James W. Pfeiffer, Santa Clara, and Larry D. Wickwar, San Mateo, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Feb. 17, 1976, Ser. No. 658,219

Int. Cl.[2] G04B *19/30*

U.S. Cl. 58—50 R **9 Claims**



1. An electronic wristwatch comprising:

a case;

a cup-shaped module frame of electrically insulating material having a plurality of retainers with tab receiving openings located on the periphery thereof;

a lens plate of an electrically insulating material including a corresponding plurality of flexible tabs disposed on the periphery thereof for engaging corresponding ones of said retainers on said frame, thereby flexibly suspending said lens plate in said frame;

a substrate mounted to said lens plate and having rigidly mounted thereto a frequency standard, a frequency divider, an electro-optical display means, and means for driving said display, said substrate including printed electrical circuit means for coupling the constituent components of the circuit forming said electronic watch;

at least one battery mounted in an opening in said frame and having a terminal thereof electrically coupled to the printed means on said substrate; and

means for securing said at least one battery in said frame and for coupling a second terminal of said battery to circuitry on said substrate.

4,068,465

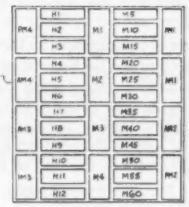
CLOCK USING ALTERNATING CURRENT CYCLE COUNTING

David C. Bacon, Clarkston, Mich., assignor to Bernard M. Licata, St. Clair Shores, Mich.

Filed July 14, 1975, Ser. No. 595,567

Int. Cl.[2] G04B *19/30*

U.S. Cl. 58—50 R **14 Claims**



1. Improvement in a clock in which time is kept by counting the cycles of an alternating current source and having power supply means providing both alternating and direct current power, display means for displaying time including a plurality of lights and windows corresponding to said lights, said direct current power including a variable display voltage for illuminating said lights, pulse generator means for generating pulses from said alternating current source, counting means for counting and dividing the output of said pulse generator means, said display means decoding the output of said counting means and lighting said lights and windows in accordance with the time of day, said improvement comprising setting means operative upon said counting means for correcting the time displayed by said clock, said setting means including a plurality of electrical switch means corresponding to said lights, actuation of any of said switch means completing an electrical circuit to up date said counting means, comparator means for comparing, upon actuation of one of said switch means said display voltage with the voltage applied to the light whose corresponding switch means is actuated, said comparator means operative, whenever the compared voltages are unequal, to actuate said counting means to correct the time displayed by said clock.

4,068,466

COUPLING DEVICE OF THE BACK-COVER AND THE MIDDLE OF A WATERPROOF SHAPED W TCH-CASE

Lucien Tissot, La Chaux-de-Fonds, Switzerland, assignor to Jean-Louis Kernen, La Chaux-de-Fonds, Switzerland

Filed Mar. 9, 1976, Ser. No. 665,334

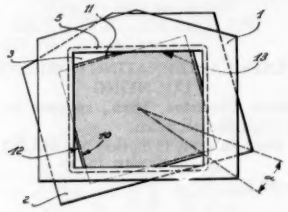
Claims priority, application Switzerland, Mar. 11, 1975, 3044/75

Int. Cl.[2] G04B *37/08*

U.S. Cl. 58—90 R **9 Claims**

1. A bayonet-type coupling device of the back-cover and the middle of a waterproof shaped watch-case, in which said middle presents a hollow comprising a groove in its internal wall and said back-cover comprises a wall provided with at least two outwardly extending ledges, and in which the sizes of said wall and of said hollow are such that, for at least an angular position of the back-cover with regard to the middle, they are free, the wall of the back-cover being placed within the hollow of the middle, and that, for at least another angular position,

they are coupled by engagement of at least a part of the ledges in the groove, characterized by the fact that said angular coupling position is defined by the contact of a part of the external surface of the wall of the back-cover with the internal surface of the hollow, both these surfaces having the same shape and the same sizes, so that the external surfaces of the middle and



of the back-cover are in coincidence; by the fact that the external surface of the wall of the back-cover comprises at least an edge, constituting a locking strong point, cooperating with the internal surface of the hollow in order to lock the back-cover and the middle in their coupling angular position; and by the fact that a watertight joint is disposed between the middle and the back-cover and surrounds the wall of said back-cover.

4,068,467

FORGED MASTER LINK FOR SLING CHAIN DEVICES

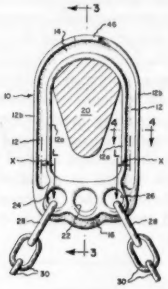
Kenneth D. Schreyer, Clarence, and Edward R. Behnke, Lockport, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed July 29, 1976, Ser. No. 709,865

The portion of the term of this patent subsequent to Sept. 28, 1990, has been disclaimed.

Int. Cl.² F16G *13/12*

U.S. Cl. 59—93 **4 Claims**



1. A sling chain device comprising in combination:

a master link, said master link having a generally oblong configuration defined by substantially straight opposite side leg portions, a hanging end portion joining upper ends of said leg portions and a load carrying end portion joining lower ends of said leg portions, said leg portions being of I-beam sectional form, said load carrying end portion being provided with a plurality of eyes, a pair of said eyes being disposed one eye in substantial longitudinal alignment with each of said leg portions;

at least two sling chains; and

at least two sling chain connecting links connected one to each of said sling chains and passing one through each eye of said pair of eyes for connecting said sling chains to said master link, said connecting links having a size exceeding the size of links of said sling chains and being sized relative to said eyes and portions of said load carrying end portion bounding said eyes as to permit said connecting links to freely pivot within said eyes relative to said master link.

4,068,468

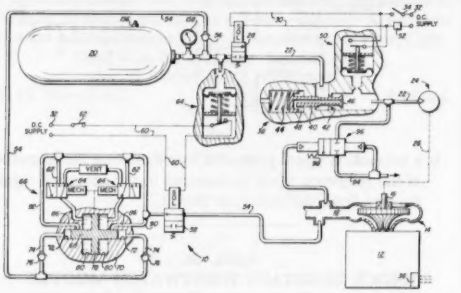
STARTING METHOD AND SYSTEM FOR A GAS TURBINE

Palmer R. Wood, Scottsdale, and James A. Rhoden, Phoenix, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 29, 1975, Ser. No. 582,007

Int. Cl.² F02C *7/26*; F04B *17/00, 9/08*

U.S. Cl. 60—39.14 **29 Claims**



1. In combination with a gas turbine machine having a compressor:

a reservoir for pressurized gas;

an expanding rotary vane motor communicating with said reservoir and operably coupled to drive said compressor;

means including a conduit between said motor and said reservoir, for connecting said reservoir with said motor and delivering pressurized gas from said reservoir to said motor to effect rotation of said compressor to initiate starting of said machine;

pressure amplifier means connected with said reservoir and said compressor being supplied with gas at a first pressure from said compressor during operation of said machine, said amplifier means for delivering gas to said reservoir at a second pressure greater than said first pressure; and

a pressure regulating valve disposed in said conduit operable to reduce pressure of gas supplied from said reservoir to a relatively constant preselected third pressure substantially less than said second pressure prior to delivery to said motor.

4,068,469

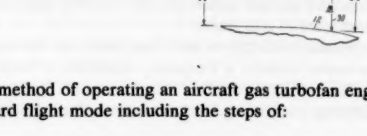
VARIABLE THRUST NOZZLE FOR QUIET TURBOFAN ENGINE AND METHOD OF OPERATING SAME

Arthur P. Adamson, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 29, 1975, Ser. No. 581,750

Int. Cl.² F02K *3/06*

U.S. Cl. 60—204 **9 Claims**



1. A method of operating an aircraft gas turbofan engine in a forward flight mode including the steps of:

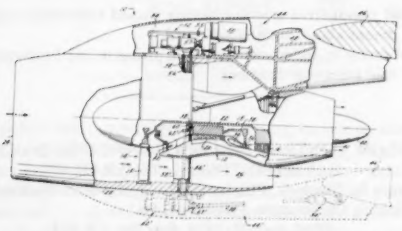
pressurizing air flowing through a stage of rotating fan blades disposed within an inlet duct;
passing a portion of the air through an annular bypass duct of generally fixed geometry;
discharging said portion through a nozzle of the type having a generally constant inlet area and variable exit area; and
modulating the nozzle exit area from a first value associated with a flight cruise operating condition which is convergent with respect to the nozzle inlet to a second value which is at least five percent greater than the first value, thereby reducing engine thrust and noise; and wherein fan blade rotational speed is essentially constant.

4,068,470

GAS TURBINE ENGINE WITH CONVERTIBLE ACCESSORIES

Donald F. Sargisson, and Arthur P. Adamson, both of Cincinnati, Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,109
Int. Cl.[2] F02K *3/02;* **F16H** *35/00, 1/14*
U.S. Cl. 60—226 R **5 Claims**



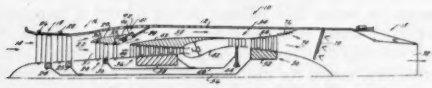
1. A gas turbine engine comprising:
a core engine including a core shaft;
a nacelle partially circumscribing said core engine;
first gear means within said core engine and driven by said core shaft;
a plurality of circumferentially spaced hollow struts extending radially between said core engine and said nacelle and in general axial alignment with said first gear means;
convertible accessory means disposed external to said nacelle and in general alignment with one of said struts; and
drive shaft means, one end of which is drivingly connected to said accessory means, and the other end of which includes a second gear means insertable into any of said hollow struts and into driving engagement with said first gear means, and
wherein said first gear means and said second gear means may be disengaged by withdrawing said drive shaft means radially outwardly with respect to said core shaft.

4,068,471

VARIABLE CYCLE ENGINE WITH SPLIT FAN SECTION

John Robert Simmons, Cincinnati, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed June 16, 1975, Ser. No. 587,134
Int. Cl.[2] F02K *3/06*
U.S. Cl. 60—262 **7 Claims**



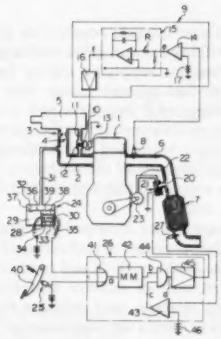
1. An improved variable cycle gas turbine engine of the type having an inlet for supplying a gas flow to a gas generator comprising a compressor, a combustor, and a high pressure turbine in serial flow relation, wherein the improvement comprises:
a fan disposed in the inlet having a front section for receiving and compressing the total inlet airflow and an aft section axially displaced downstream from the front fan section,
duct means for bypassing a portion of the inlet gas flow around the aft fan section and gas generator, and
diverter valve means disposed intermediate the aft fan section and gas generator for controlling the amount of gas flow from the front fan section to the bypass duct means, aft fan section and gas generator and movable between a first position in which the total gas flow exiting the front fan section is directed to and compressed by the aft fan section and the airflow exiting the aft fan section is divided between the bypass duct means and gas generator, and a second position in which the gas flow exiting the front fan section is divided between the bypass duct means and aft fan section, and the total gas flow exiting the aft fan section is directed to the gas generator.

4,068,472

FIRST AND SECOND AIR FEEDING MEANS TO REGULATE A/F RATIO WHEREIN SECOND AIR FEED REQUIRES TWO SIGNALS FOR ACTUATION

Akira Takata; Toshio Tanahashi, and Toshio Oda, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 30, 1976, Ser. No. 718,535
Claims priority, application Japan, May 18, 1976, 51-56024
Int. Cl.[2] F02B *75/10;* **F01N** *3/15;* **F02M** *23/00*
U.S. Cl. 60—276 **19 Claims**



1. An exhaust gas purifying device in an internal combustion engine having at least one cylinder, comprising:
an intake and an exhaust passage of said engine;
means for producing a rich air-fuel mixture in said intake passage;
a catalytic converter containing a three way catalyzer therein and disposed in said exhaust passage;
first detecting means for detecting the concentration of oxygen containing in the exhaust gas flowing in the exhaust passage located upstream of said catalytic converter, said first detecting means issuing a first output signal indicative of the concentration of oxygen;
means for regulating the air-fuel ratio of said rich air-fuel mixture so that said air-fuel ratio conforms to the stoichiometric air-fuel ratio in response to said first output signal of said first detecting means;
second detecting means for detecting the concentration of oxygen contained in the exhaust gas flowing in the exhaust passage located downstream of said catalytic converter, said second detecting means issuing a second output signal indicative of the concentration of oxygen;
third detecting means for detecting the accelerating, decelerating, and gear-shifting operations of the engine and for

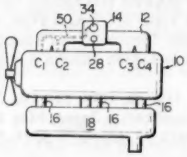
issuing a third output signal indicative of said operations, and means for feeding secondary air into the exhaust gas flowing in the exhaust passage located upstream of said catalytic converter so that the ratio of air consisting of said secondary air and air contained in the mixture introduced into the cylinder of the engine to the fuel contained in the mixture introduced into the cylinder of the engine is made equal to the stoichiometric air-fuel ratio in response to both said second and third output signals of said second and third detecting means at the time of acceleration, deceleration and gear-shifting.

4,068,473

AIR-FUEL MIXTURE DISTRIBUTION SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 20, 1975, Ser. No. 560,527
Claims priority, application Japan, Apr. 22, 1974, 49-45210
Int. Cl.[2] F01N *3/10*; F02B *75/10*
U.S. Cl. 60—282 **3 Claims**



1. In a multi-cylinder internal combustion engine equipped with means for purifying exhaust gases discharged from all the cylinders, the system for supplying during low load engine operation a first air-fuel mixture leaner than stoichiometric mixture into predetermined cylinders and a second air-fuel mixture richer than stoichiometric mixture into the remaining cylinders, and during medium and high load engine operations the first air-fuel mixture into all the cylinders, comprising:

a carburetor for supplying the first air-fuel mixture into all the cylinders; and

a mixture enriching device arranged to supply supplemental fuel from the fuel chamber of said carburetor into portions upstream of the intake ports of said remaining cylinders to enrich the first air-fuel mixture therethrough into the second air-fuel mixture, said mixture enriching device being arranged to supply the supplemental fuel in response to the engine load only during low load engine operation.

4,068,474

APPARATUS AND PROCESS FOR STEAM GENERATION BY SOLAR ENERGY

Boris Dimitroff, 4014 Perlita Ave. No. 6, Los Angeles, Calif. 90039

Filed Aug. 30, 1976, Ser. No. 718,402
Int. Cl.[2] F03G *7/02*
U.S. Cl. 60—641 **6 Claims**

1. For use in a steam generating system having a conventional steam turbine,

apparatus to generate steam from solar energy, comprising

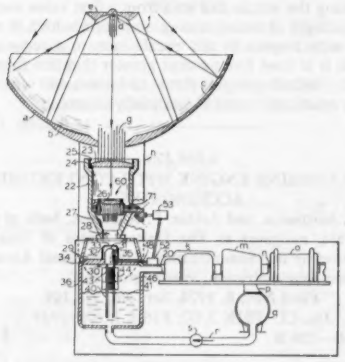
reflector means to concentrate said solar energy and

lens means to focus such solar energy substantially at a focal point,

a conductor element having a heat-receiving head portion positioned substantially at said focal point, whereby such energy impinges thereon, and having a conductive portion depending therefrom,

a water reservoir chamber having a normal water level and a head space thereabove including a steam outlet communicating with such turbine, said conductor element being mounted in a top wall of said reservoir chamber with its head portion projecting thereabove and its heat conducting portion extending downward into the lower part of said reservoir chamber,

whereby its lower end projects below such water level, thereby to conduct heat to such water,



said conductive portion having finned convection surface means above such water level,

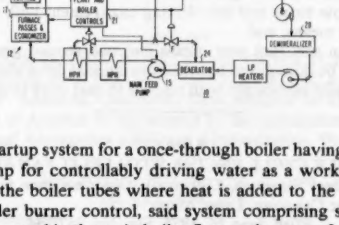
whereby to superheat the steam rising in the head-space of said reservoir chamber.

4,068,475

FLOW CONTROL FOR ONCE-THROUGH BOILER HAVING INTEGRAL SEPARATORS

Morton H. Binstock, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1976, Ser. No. 678,525
Int. Cl.[2] F01K *13/02*
U.S. Cl. 60—646 **10 Claims**



1. A startup system for a once-through boiler having a boiler feed pump for controllably driving water as a working fluid through the boiler tubes where heat is added to the working fluid under burner control, said system comprising separator means disposed in the main boiler flow path, means for detecting separator level, drain valve means for varying a drain flow from the separator means to balance boiler inflow and outflow during startup, first means for controlling said drain valve means for boiler flow balance during startup in response to a separator water level signal from said detecting means over a first working fluid pressure range up to a pressure below supercriticality, means for displacing said first control means from controlling effect at pressure above the first range and at a pressure below a pressure value at which the level signal becomes invalid, and second means for controlling said drain valve means for boiler flow balance during startup in response

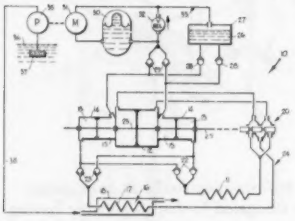
to a signal representative of at least one predetermined boiler operating parameter other than separator level at pressures above the first pressure range.

4,068,476

SOLAR DRIVEN POWER UNIT

Christopher George Kelsey, Glenalta, Australia, assignor to Andrew Graham Brown and K. E. Ellis Holdings Pty. Ltd., both of Australia

Filed Nov. 14, 1974, Ser. No. 523,909
Claims priority, application Australia, Nov. 15, 1973, 5654/73
Int. Cl.[2] F01K *25/10*
U.S. Cl. 60—671 **12 Claims**



1. A power unit comprising a double acting vapour pressure actuated motor, a first pump, a mechanical coupling between the motor and first pump, a condenser, an evaporator, conduits and valves interconnecting said evaporator, motor, first pump and condenser in a closed thermodynamic circuit, and a fluorocarbon refrigerant fluid in both liquid and vapour phases contained in the circuit, such that heating the liquid phase in the evaporator causes evaporation of the vapour at pressure which in turn applies pressure to one side of the motor and thereby actuates the motor, actuation of the motor effecting exhaustion of vapour from the other side of the motor into the condenser wherein the vapour is condensed, and then pumped as liquid by the first pump from the condenser, and through the evaporator to complete the fluid thermodynamic cycle,

the unit also comprising a second pump being an hydraulic pump, an hydraulic motor, hydraulic conduits and valves coupling the second pump and hydraulic motor in hydraulic circuit, and a mechanical coupling between the vapour pressure actuated motor and the hydraulic pump such that operation of the vapour pressure actuated motor also causes operation of the hydraulic pump and consequential operation of the hydraulic motor.

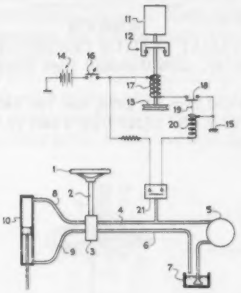
4,068,477

DEVICE FOR CONTROLLING ACCESSORIES DRIVEN BY THE ENGINE OF A VEHICLE HAVING AN ASSISTED STEERING

Pascal Lefebvre, Paris, France, assignor to Automobiles Peugeot, Paris, France

Filed Feb. 28, 1977, Ser. No. 772,570
Claims priority, application France, Mar. 1, 1976, 76 05727
Int. Cl.[2] F01B *21/00;* **F04B** *49/08*
U.S. Cl. 60—698 **2 Claims**

1. In a device for controlling at least one accessory which operates in an intermittent manner and is driven through a connection by the heat engine of a vehicle which has a hydraulic steering assistance supplied with fluid under pressure through a delivery pipe by a pump driven by said engine, said accessory being driven by the engine through an electromagnetic clutch controlled by an electric circuit; the improvement comprising, disposed in said delivery pipe, a pressure-switch which is connected in said electric circuit controlling the



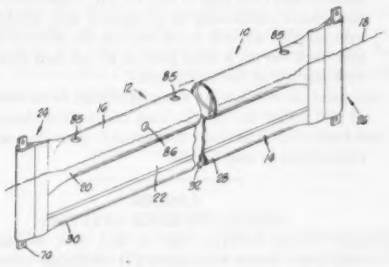
clutch so as to cut off said connection when the delivery pressure of the pump reaches a predetermined threshold value.

4,068,478

CONTAINMENT BARRIER SECTION ARRANGEMENT

Frank Meyers; Henry J. Folson, and Gwenn B. Meyers, all of Los Angeles, Calif., assignors to Frank Meyers, Torrance, Calif.

Filed Nov. 3, 1975, Ser. No. 628,231
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F **78 Claims**



1. In an improved containment boom section, the improvement comprising, in combination:

flotation means having a predetermined buoyancy to provide upper portions thereof above the surface level of a liquid body for the condition of the boom section in the liquid body, and a lower portion below the surface level;

said flotation means comprising:

an elongated, flexible, generally tubular member having walls having internal surfaces defining an internal cavity and having a first end and a second end, and longitudinally compressible-expandable between a compressed, storage condition and an elongated, deployed condition;

a transversely rigid and longitudinally compressible-expandable means substantially free of longitudinal resilient forces in said cavity extending substantially from said first end to said second end of said tubular member and bearing against said internal surfaces of said walls of said tubular member for maintaining a predetermined transverse cross-sectional configuration of said tubular member in said compressed and said elongated condition;

connection means coupled to said tubular member for connecting said transversely rigid and longitudinally compressible-expandable means to said tubular member; and

vent means in said tubular member in regions adjacent said

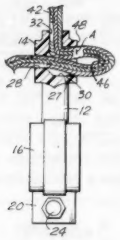
upper portion of said flotation means for providing an air passageway between said cavity and regions external said flotation means.

4,068,479

FLOAT TETHER TERMINATOR

Noel W. Lane, Jr., 2106 Windmill View Road, El Cajon, Calif. 92020

Filed Dec. 31, 1975, Ser. No. 645,785
Int. Cl.[2] E02B *3/04*; F16G *11/00*
U.S. Cl. 61—5 **3 Claims**



1. In a tethered float breakwater assembly for reducing wave motion in water comprising at least one float; a tether line respectively connected at one end to said float; and a submerged ballast connected to the other end of said tether line, the improvement comprising:

elastomeric means at each end of said tether line joining the same to said float and to said ballast, respectively, each of said means comprising an elongated, soft, pliable neck of substantially uniform cross section for most of its length, said neck having a head portion at one end thereof and a base portion at the other end;

said head portion having a configuration to receive one end of said tether line in a locking connection therewith; and

said base portion having a formation to provide a mechanical connection to said ballast.

4,068,480

LIQUID STORAGE SYSTEMS

Kenneth Winans Lefever, Rte. 1, Box 134, Waterford, Va. 22901; John James Gallagher, 171 Williams Drive, Annapolis, Md. 21401

Filed Nov. 13, 1975, Ser. No. 631,686
Int. Cl.[2] B65D *25/24*
U.S. Cl. 61—0.5 **17 Claims**

1. A system for storing liquids of different densities comprising;

walls defining a liquid-impervious outer chamber;

a flexible liquid-impervious membrane disposed in spaced relation to said walls to define an inner chamber containing the less dense of said liquids;

the more dense of said liquids filling the space between said chambers;

means to adjust the level of the less dense of said liquids to a level substantially equal to that of the more dense of said liquids;

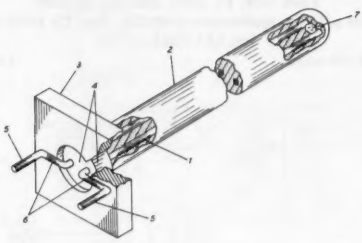
means to overcome the density differential between said liquids such that the surface level of the more dense of said liquids is at least substantially equal to that of said liquids.

4,068,481

SELF-RETAINING ROOF BOLT

William G. Toland, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 5, 1977, Ser. No. 794,166
Int. Cl.[2] E21D *21/00, 20/00*
U.S. Cl. 61—45 B **9 Claims**



1. A self-retaining roof bolt comprising:

a. an elongated U-shaped member having a pair of spaced leg sections depending from the connection portion of said U-shaped member, said leg sections being formed to support a flat plate fitted over said U-shaped member;

b. a grouting coated on said U-shaped member to maintain said leg sections under transverse tension at ambient temperature, said grouting being malleable at elevated temperatures;

c. a flat plate having an opening therein positioned over said U-shaped member and supported by said leg sections, said opening being large enough to permit said leg sections to move transversely on release of said transverse tension a sufficient amount to maintain said U-shaped member in place in a roof hole; and

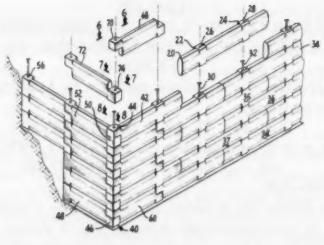
d. a gasket abutting said flat plate member and in sealing engagement with the lower portion of said U-shaped member to prevent flow of said coating below said plate at elevated temperature.

4,068,482

RETAINING WALL STRUCTURE USING PRECAST STRETCHER SECTIONS

William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Company, Eureka, Calif.

Filed Aug. 2, 1976, Ser. No. 711,081
Int. Cl.[2] E02D *17/00*
U.S. Cl. 61—47 **15 Claims**



1. A retaining structure comprising: a plurality of courses of preformed stretchers having an elongated body with integral first and second support heads, said heads being spaced apart a predetermined fixed distance and having generally flat upper

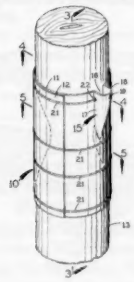
and lower stacking surfaces, the vertical depth of said heads as measured between the upper and lower surfaces thereof being greater than the vertical depth of the length of the stretcher disposed between said support heads, each of said heads having a vertical tie rod hole generally centrally located in said head for receiving a tie rod; and vertically extending tie rods secured to the lowermost course of stretchers and extending upwardly therefrom through the holes in the courses of stretchers thereabove.

4,068,483

PROTECTIVE SHEATH FOR WATER-ERODED WOOD PILING

Charles A. Papworth, 1018 SW. 21st St., Fort Lauderdale, Fla. 33315

Filed Dec. 22, 1976, Ser. No. 753,288
Int. Cl.[2] E02D *5/60*
U.S. Cl. 61—54 **4 Claims**



1. In a protective sheath for attachment to an upstanding wood piling in place in a body of water and having a water-eroded area in the vicinity of the water line, said protective sheath comprising a preformed, longitudinally split casing of water-resistant plastic material having a length greater than the height of the eroded area of the piling for circumferentially enclosing the latter, said casing having overlapping opposite circumferential end segments disconnected from each other along the entire length of the casing and arranged with one circumferentially overlapping the other on the outside, said end segments of the casing being sufficiently flexible to be spread apart to enable the casing to be expanded radially and applied around the piling and being sufficiently resilient to spring back into said overlapping relationship after the casing has been applied around the piling, and means for clamping said casing directly to the piling above and below the eroded area,

the improvement wherein said casing has a preformed integral, outwardly offset spout at its upper end spaced circumferentially from said overlapping end segments and providing at the top of the casing a pour opening for concrete or the like, said spout extending down along the casing a distance sufficient to reach the eroded area of the piling to which the casing is applied.

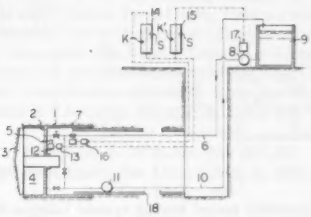
4,068,484

AUTOMATIC TUNNEL FACE HYDRAULIC PRESSURE CONTROLLING APPARATUS IN SHIELD TYPE HYDRAULIC TUNNEL BORING SYSTEM

Yasuyuki Iwamitu, Ichikawa; Yoshiaki Uchida, Koshigaya; Shigeru Kobayashi, and Masamitu Tateno, both of Tokyo, all of Japan, assignors to Tekken Construction Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,037
Claims priority, application Japan, Apr. 5, 1976, 51-37201
Int. Cl.[2] E21D *9/00*
U.S. Cl. 61—85 **3 Claims**

1. In a hydraulic tunnel boring system using a shield type boring excavator including a hydraulic pressure chamber defined between a rotary cutter head and a bulkhead, said chamber is filled with a hydraulic material fed through a feeding pipe from a hydraulic material reservoir and a mixture of said material and ground formations excavated by rotation of said cutter head is discharged through a discharging pipe to the reservoir, an apparatus for automatically conrolling tunnel face hydraulic pressure in said chamber, which comprises a regulating valve provided in said feeding pipe at a position close to said bulkhead, a feeding pump provided in the feeding pipe, a pressure gauge provided in the hydraulic pressure chamber for measuring actual tunnel face hydraulic pressure in



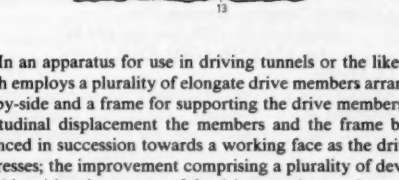
the chamber, a pressure signal transmitter connected to said gauge for converting pressure value measured and provided by the gauge into an electric signal, a first regulator receiving said signal from said transmitter and controlling said regulating valve in response to differences between the signal indicating said actual tunnel face hydraulic pressure and a predetermined pressure preliminarily set in said first regulator, and a second regulator receiving the signal from the transmitter and controlling pumping rate of said feeding pump in response to differences between the signal indicating the actual tunnel face hydraulic pressure and a predetermined pressure preliminarily set in said second regulator.

4,068,485

APPARATUS FOR DRIVING TUNNELS OR THE LIKE

Dieter Stuckmann, Selm; Hans Jutte, Dortmund-Brechten; Siegmund Babendererde, Bad Vilbel, and Reinhard Bokemeyer, Offenbach, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen and Hochtief AG, Frankfurt, both of Germany

Filed Aug. 2, 1976, Ser. No. 710,820
Claims priority, application Germany, Aug. 5, 1975, 2534860
Int. Cl.[2] E01G *3/00*
U.S. Cl. 61—85 **17 Claims**



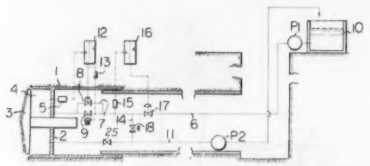
1. In an apparatus for use in driving tunnels or the like and which employs a plurality of elongate drive members arranged side-by-side and a frame for supporting the drive members for longitudinal displacement the members and the frame being advanced in succession towards a working face as the driving progresses; the improvement comprising a plurality of devices movable with at least some of the drive members and means of automatically extending said devices from the drive members when the frame is shifted to bring the devices into a position for treating the working face.

4,068,486

AUTOMATIC TUNNEL FACE HYDRAULIC PRESSURE CONTROLLING APPARATUS IN SHIELD TYPE HYDRAULIC TUNNEL BORING SYSTEM

Yoshiaki Uchida, Koshigaya; Akira Nakaya, and Kunitaka Saito, both of Tokyo, all of Japan, assignors to Tekken Construction Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,038
Claims priority, application Japan, Sept. 8, 1976, 51-106820
Int. Cl.[2] E21D *9/00*
U.S. Cl. 61—85 **4 Claims**



1. In a hydraulic tunnel boring system using a shield type boring excavator including a hydraulic pressure chamber defined between a rotary cutter head and a bulkhead, said chamber is filled with a hydraulic material fed through a feeding pipe from a hydraulic material reservoir and a mixture of said material and ground formations excavated by rotation of said cutter head is discharged through a discharging pipe to the reservoir, an apparatus for automatically controlling tunnel face hydraulic pressure in the chamber, which comprises a first pressure gauge provided in the chamber for measuring the tunnel face hydraulic pressure, a first bypass pipe of said feeding pipe provided at a position close to said bulkhead, a first pressure regulating valve provided in said first bypass pipe, a second pressure regulating valve provided in the feeding pipe so that the first bypass pipe will be disposed across said second regulating valve, a first pressure regulator connected to said first pressure gauge and second regulating valve for controlling the second valve in response to differences if any between the tunnel face hydraulic pressure measured by the first pressure gauge and a predetermined feeding pressure preliminarily set in said first pressure regulator, a second pressure gauge provided in the feeding pipe upstream the first bypass pipe for measuring fed-hydraulic-material pressure in the feeding pipe, a third pressure regulating valve provided in the feeding pipe upstream said second pressure gauge, and a second pressure regulator connected to said second pressure gauge and third regulating valve for controlling the third regulating valve in response to differences if any between said fed-hydraulic-material pressure measured by the second pressure gauge and a predetermined feed pressure preliminarily set in said second pressure regulator.

4,068,487

METHOD AND APPARATUS FOR CONDUCTING SUBAQUEOUS OPERATIONS IN ICE CONDITIONS

Floyd Tim Pease, Houston; Gerhard Helmut Rensswig, Conroe, and Porter Russell Edling, Houston, all of Tex., assignors to The Offshore Company, Houston, Tex.

Filed Apr. 30, 1976, Ser. No. 682,187
Int. Cl.[2] E02B *17/00;* **E21B** *15/00*
U.S. Cl. 61—93 **3 Claims**

1. An improved platform from which subaqueous operations are performed in ice conditions, the platform having an aperture therethrough through which the subaqueous operations are performed, the improvement comprising:

at least two lower skid beams secured to the face of the platform, the two lower skid beams being positioned parallel to each other on opposite sides of the aperture;

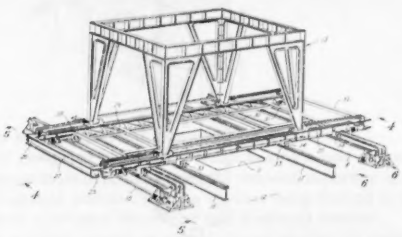
at least two upper skid beams positioned the top of the lower skid beams, the two upper skid beams being positioned parallel to each other on opposite sides of the aperture;

a substructure for supporting equipment for performing the subaqueous operations positioned atop the upper skid beams;

at least one carriage rail mounted longitudinally along selected lengths of each of said upper skid beams and said lower skid beams;

at least two travelling members carried by the underside of the substructure, each travelling member being associated with an upper skid beam, each of such travelling member including a wheel for communicating with the carriage rail mounted on such upper skid beam and presenting relatively low lateral resistance between the substructure and the upper skid beam whereby the substructure may move in either direction longitudinally along the upper skid beams;

at least two travelling members carried by the underside of the upper skid beams, each travelling member being associated with a lower skid beam, each of such travelling members including a wheel for communicating with the carriage rail mounted on such lower skid beam and presenting relatively low lateral resistance to the movement of the upper skid beam relative to the lower skid beam whereby the upper skid beams may move in either direction longitudinally along the lower skid beams;



a gear rack mounted longitudinally along selected lengths of each of said upper and lower skid beams;

a drive pinion carried by each of the travelling members and in communication with gear rack mounted on the respective skid beam with which the travelling member is associated;

a drive motor associated with each travelling member and operatively coupled to the drive pinion for generating motive forces to revolve the drive pinion whereby the substructure may be moved in either direction longitudinally along the upper skid beam and the upper skid beams may be moved in either direction longitudinally along the lower skid beams.

4,068,488

METHOD OF BACKFILLING PIPELINE TRENCHES

D. Graham Ball, North Vancouver, Canada, assignor to Rader Companies, Inc., Portland, Oreg.

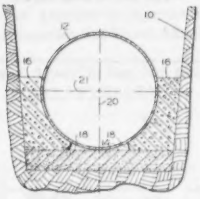
Filed Apr. 30, 1975, Ser. No. 573,021
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—105 **12 Claims**

1. A method of backfilling a trench containing a pipeline comprising:

temporarily supporting said pipeline at a desired final position and grade within said trench spaced from the opposite sides of said trench and spaced above the bottom of the trench on removable support pads spaced at intervals along the bottom of said trench,

at a portion of said pipeline unsupported by said support pads blowing under pneumatic pressure a granular fill material into said trench first below and into the space beneath and about said pipeline and then progressively upwardly about and along the opposite sides of said pipe-

line to fill the trench spaces about the pipeline to at least about the spring line thereof, said fill material being blown at a velocity sufficient to simultaneously backfill said trench and compact said granular fill material to a substantially uniform desired final density about said pipeline to support the same at its final position and grade within said



trench, whereby subsequent compaction of said fill material is not required,

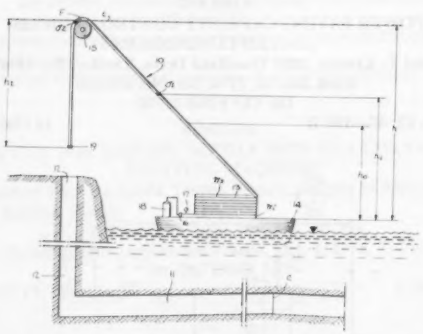
and continuing the aforesaid pneumatic filling operation progressively in a given direction along said trench and removing said support pads seriatim as the filling operation approaches each said pad.

4,068,489

METHOD AND APPARATUS FOR LAYING AN OIL FILLED CABLE AT DEPTHS BELOW THE LAYING EQUIPMENT

Paolo Gazzana Priaroggia, Milan, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Aug. 31, 1976, Ser. No. 719,121
Claims priority, application Italy, Sept. 26, 1975, 27675/75
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—105 **5 Claims**



1. A method for laying an oil filled cable which is subject to damage when the pressure of the oil therein exceeds a predetermined limit, from a first point to a second lower point which is below said fiirst point by a distance sufficient to cause the weight of said oil in a vertical length of said cable equal to said distance to exert a pressure on said cable which exceeds said limit, said method comprising:

feeding an end of said cable with said oil under normal pressure therein from said first point to a third point at a level above said first point by a further distance which is sufficient to produce a relative oil pressure of zero within the cable and at a fourth point therein intermediate said first and third points but which is insufficient to cause the oil pressure in said cable to exceed said limit;

feeding said end of said cable from said third point downwardly toward said second point;

as said cable is fed from said third point to said second point and prior to the time that the pressure at said end thereof exceeds said limit, reducing the pressure of the oil in said cable at said first point thereby to cause oil to flow away from said third point whereby a vacuum is produced in said cable adjacent said third point and the pressure of the oil at said end of said cable is reduced; and

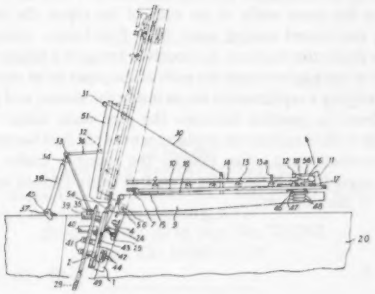
continuing the feeding of said cable end downwardly to said second point while maintaining the pressure of the oil at said end at less than said limit by adjusting the pressure of the oil in said cable at said first point.

4,068,490

METHOD AND APPARATUS FOR ASSEMBLING AND LAYING UNDERWATER PIPELINE

Michel J. Jegousse, Nantes, France, assignor to Compagnie Francaise des Petroles, Paris Cedex; Etudes Petrolieres Marines, Societe, Paris; Ateliers et Chantiers de Bretagne, Nantes; Compagnie Maritime d'Expertises, Marseille; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS), Paris and Entreprise de Recherches et d'Activites Petrolieres (E.R.A.P.), Paris, all of France

Filed May 5, 1976, Ser. No. 683,345
Claims priority, application France, May 6, 1975, 75 14079
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—108 **31 Claims**



1. A method of assembling and laying an undersea pipe from a surface support having a variable inclination laying ramp comprising: sequentially fixing a new pipe section to the end of a pipe portion already submerged, supporting said submerged section at the end to be coupled on the laying ramp, and moving said surface support by a distance corresponding to the length of the new pipe section simultaneously with submersion of the new pipe section, wherein said submerged pipe portion is suspended from said surface support and the tension in said submerged pipe portion is maintained substantially constant irrespective of vertical movements of said surface support relative thereto by providing first damping means between the pipe suspension means and said surface support.

4,068,491

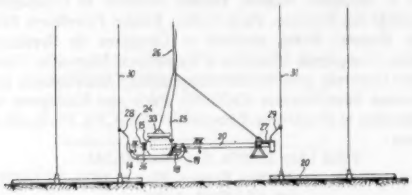
METHOD AND APPARATUS FOR CONNECTING THE ENDS OF SUBMERGED PIPES

Philippe C. Nobileau, Neuilly-sur-Seine; Rene M. Dermy, Courcouronnes, and Guy J. Fleury, Paris, all of France, assignors to Compagnie Francaise des Petroles, Paris Cedex; Etudes Petrolieres Marines, Paris; Ateliers et Chantiers de Bretagne-A.C.B., Nantes; Compagnie Maritime d'Expertises, Marseille; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS), Paris and Entreprise de Recherches et d'Activites Petrolieres (E.R.A.P.), Paris Cedex, all of France

Filed Dec. 14, 1976, Ser. No. 750,315
Claims priority, application France, Dec. 19, 1975, 75 38988
Int. Cl.[2] F16L *1/04*
U.S. Cl. 61—110 **12 Claims**

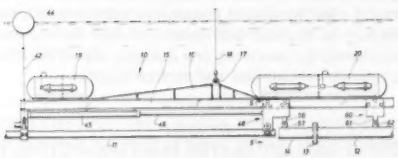
1. A method of connecting two ends of submerged pipes

using a receiver which is provided with two apertures through which the pipe ends extend, the method comprising introducing the pipe ends into the receiver, at least one of said pipe ends being introduced by movement of the receiver relative to the pipe end, after the introduction of the ends of the two pipes, lowering an undersea intervention unit onto said receiver to create by their assembly a watertight enclosure for an intervention crew for connecting the two ends of the pipes by means of a sleeve, the watertightness of the outer envelope of the assembly being ensured by seal means which establish the connection between the outer surfaces of the pipes and the apertures in the



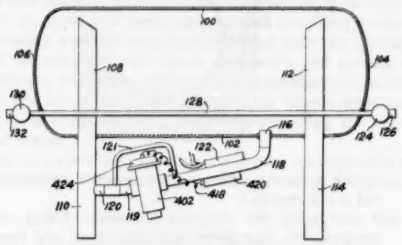
receiver, the watertightness of the inner envelope being ensured by two stoppers bearing seal means which are applied against the inner walls of the ends of the pipes, the stoppers being maintained spaced apart by a first boom, arranging a sleeve inside the receiver, the receiver being of a length appropriate to the gap between the ends of the pipes to be connected and carrying a replacement boom inside the sleeve, and placing the sleeve in position between the pipe ends under remote control with simultanoues replacement of the first boom by the replacement boom, after placing the receiver under hydrostatic pressure to balance the pressures being exerted upon the faces of the stoppers.

4,068,492
UNDERWATER PIPELINE COUPLING APPARATUS
Bobby J. Reneau, P.O. Box 14, Bellaire, Tex. 77401
Filed Aug. 5, 1976, Ser. No. 711,991
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—110 **10 Claims**



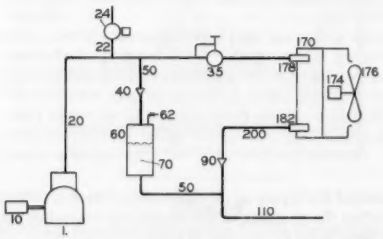
1. An apparatus for achieving underwater connection of a first pipe which is telescoped into a second pipe, comprising:
an elongate frame member;
means for releasably clamping said frame member parallel to a first pipe;
second means for clamping said elongate frame member relative to a second pipe, the first and second pipes being parallel to one another and axially spaced apart;
moving means carried on said elongate frame member and connected between said first and second clamp means for pulling one of said clamp means toward the other to move the first and second pipes toward one another and telescoping connection with one another.

4,068,493
SUCTION ACCUMULATOR FOR REFRIGERATION SYSTEMS
William Micai, Trenton, N.J., and Daniel Kramer, Yardley, Pa., assignors to Kramer Trenton Company, Trenton, N.J.
Filed Mar. 4, 1976, Ser. No. 663,867
Int. Cl.[2] F25B *43/00*
U.S. Cl. 62—194 **16 Claims**



1. Improved suction accumulator means adapted to be used in mechanical compression type refrigeration systems, said accumulator means comprising a tank having a vapor inlet, a vapor outlet, and liquid outlet means; wherein the improvement comprises: automatic control means for sensing the presence and absence of liquid refrigerant in said accumulator means; and valve means located in the liquid outlet means and subject to the control means, said valve means constituting means for restricting flow from said liquid outlet means in the presence of liquid refrigerant and for allowing flow from said liquid outlet means in the absence of liquid refrigerant.

4,068,494
POWER SAVING CAPACITY CONTROL FOR AIR COOLED CONDENSERS
Daniel E. Kramer, 2009 Woodland Drive, Yardley, Pa. 19067
Filed Jan. 19, 1976, Ser. No. 650,240
Int. Cl.[2] F25B *41/00*
U.S. Cl. 62—196 B **12 Claims**



1. An improved compression type refrigeration system including a compressor having a discharge conduit; air cooled condenser means for receiving refrigerant from the discharge conduit and condensing it, said condenser means having an inlet and an outlet, said condenser means adapted to be exposed to varying ambients; an expansion device and an evaporator; a bypass conduit having a first end connected to the compressor discharge conduit, a condenser circuit comprising an inlet conduit joining one end of the bypass conduit with the condenser inlet, the condenser means, and an outlet conduit joining the other end of the bypass conduit with the condenser outlet; receiver means connected into the bypass conduit between the first end and the other end; single pressure regulator valve means adapted to cause flow through the bypass conduit and receiver when the high side pressure is lower than a prede-

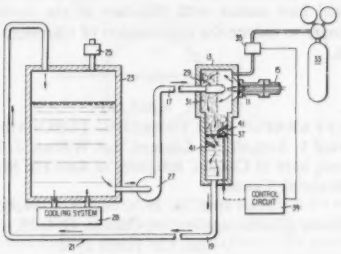
termined minimum and to prevent said flow when the high side pressure is higher than said minimum.

4,068,495

CLOSED LOOP SPRAY COOLING APPARATUS

Donald L. Alger; William B. Schwab, both of Cleveland, and Edward R. Furman, North Olmsted, all of Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1976, Ser. No. 672,220
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—376 **10 Claims**



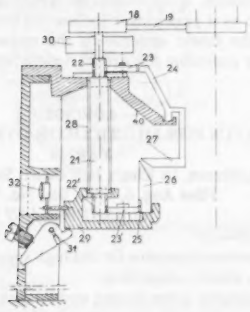
1. A closed loop apparatus for spraying a radiation target with liquid coolant comprising:
- a loop for circulating the liquid coolant including a coolant reservoir, a chamber communicating with the target, and first and second tubular connections between the reservoir and the chamber for circulating the liquid coolant therethrough;
- means disposed within the chamber and connected to one of the tubular connections for spraying the liquid coolant against the back of the target;
- a source of high pressure gas communicating with the chamber; and
- means for regulating the supply of gas to the chamber.

4,068,496

DEVICE FOR DRIVING NEEDLE BEDS IN A CIRCULAR KNITTING MACHINE

Norbert Paul Bourgeois, Troyes, France, assignor to ASA S.A., Roanne, France

Filed Sept. 27, 1976, Ser. No. 726,953
Claims priority, application France, Oct. 1, 1975, 75.30069
Int. Cl.[2] D04B *9/06*
U.S. Cl. 66—27 **7 Claims**



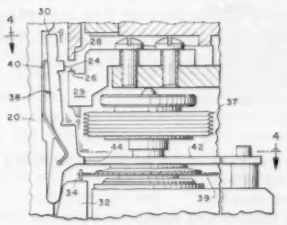
1. In a circular knitting machine of the type having a substantially vertical machine axis and a pair of synchronously rotating needle beds comprising a horizontal dial and a vertical cylinder, an improved apparatus for driving and positioning said needle beds comprising:
- a motor disposed on the machine axis;
- at least three bed drive assemblies symmetrically radially disposed equidistant from the machine axis, each said assembly comprising:
  - a rotatably driven vertical shaft having upper and lower pinion gears disposed at the ends thereof;
  - an upper intermediate gear having teeth meshing with said upper pinion gear and having associated means for rotatably driving the dial;
  - a lower intermediate gear having teeth meshing with said lower pinion gear and having associated means for rotatably driving the cylinder;
  - the teeth of said pinion gears and intermediate gears intermeshing to provide synchronous drive of the dial and cylinder and strict centering thereof;
- means for supporting the dial;
- support means for the cylinder including means for raising or lowering the cylinder relative to the dial;
- means for braking said vertical shaft;
- transmission means mechanically connecting said motor to each said vertical shaft for imparting rotation to the shafts.

4,068,497

CIRCULAR KNITTING MACHINE

George Roger Haynie, Laurens, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 19, 1976, Ser. No. 733,762
Int. Cl.[2] D04B *15/74*
U.S. Cl. 66—50 B **1 Claim**

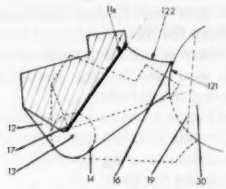


1. A circular knitting machine including a tricked needle cylinder, individually operated knitting needles in said tricks, needle controlling jacks provided below and in the same tricks as said needles and a jack raising cam operably associated with said jacks, each of said jacks having a cam engaging first butt portion and a second butt portion, said knitting machine having a plurality of yarn feed positions, a pattern attachment mounted at each yarn feed position to control the position of needle controlling jacks at each of said feed positions, a presser mounted at certain selected yarn feed positions projecting towards said jacks, means mounting control springs at certain pre-selected jack positions in engagement with said second butt portions of said jacks, and jacks at certain other jack positions having a third butt portion projecting from said second butt portion engaging said presser when said needle cylinder is rotated to place said third butt portion opposite to said presser to pivot said first butt portion out of engagement with said jack raising cam.

4,068,498
INTERLOCKING CAMS

Norbert Bourgeois, Troyes, France, assignor to ASA S.A., Roanne, France

Filed June 16, 1975, Ser. No. 586,881
Claims priority, application France, Oct. 15, 1974, 74 34681
Int. Cl.[2] D04B *15/32*
U.S. Cl. 66—57 1 Claim

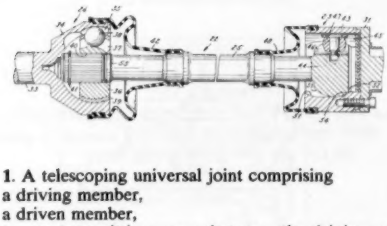


1. A circular knitting machine comprising at least one sinking cam and one movable cam enabling a selection of knitting elements to occupy several positions wherein said sinking cam is rotatably biased into a working position in which its working ramp cooperates with the butts of the knitting elements selected for knitting and can be moved to a rest position in which the working ramp cooperates with the knitting elements which are welting, said sinking cam being held in said rest position by a surface thereon which engagingly cooperates with a locking means on said movable cam when the latter is in a position to cause the knitting elements to welt.

4,068,499
TELESCOPING UNIVERSAL JOINTS

Everett H. Sharp, 344 E. Maryknoll, Rochester, Mich. 48063

Filed Jan. 26, 1976, Ser. No. 652,511
Int. Cl.[2] F16D *3/02*
U.S. Cl. 64—8 68 Claims

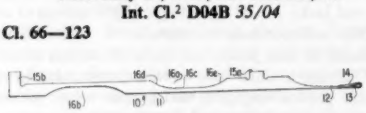


1. A telescoping universal joint comprising
a driving member,
a driven member,
torque transmitting means between the driving and driven members,
and means for limiting relative axial inward and outward movement between said members and for maintaining said members in fixed axial relationship while limiting said axial movement between said members as the joint rotates at any angular alignment of the members.

4,068,500
KNITTING MACHINE NEEDLE WITH FRONT AND BACK CUT-OUTS AND SPRING

Alfred O. Kohorn, 862 Wyckoff Ave., Brooklyn, N.Y. 11227

Filed May 13, 1976, Ser. No. 685,970
Int. Cl.[2] D04B *35/04*
U.S. Cl. 66—123 3 Claims

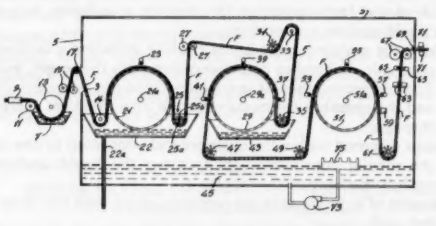


1. For use in a high speed circular knitting machine having a dial and cylinder provided with needle grooves and cams for moving the needle in said grooves, a needle comprising a flat sheet metal shank of generally rectangular transverse cross section and having an integral needle portion extending therefrom and having a hook, the needle shank having a groove contacting back and a front provided with butt means adapted for engagement with cams of a knitting machine, said needle having cut-out means at the back and at the front of the shank, said cut-out means each comprising an edge generally parallel to the longitudinal axis of the needle shank, and arcuate edges joined thereto, and spring means on the side of said needle shank and located on said shank adjacent the path of travel of vibrations from said butt means toward said needle hook for attenuating vibrations generated in said shank by engagement of said butt means with the cam of the knitting machine, whereby to reduce the transmission of vibrations to the needle hook.

4,068,501
APPARATUS FOR TREATING TUBULAR FABRICS

Edward I. Aronoff, St. Laurent, and William J. McLay, Montreal, both of Canada, assignors to Knit-Fin Machinery Ltd., Montreal, Canada

Filed Dec. 28, 1976, Ser. No. 754,951
Claims priority, application Canada, Oct. 25, 1976, 264255
Int. Cl.[2] D06B *1/08*
U.S. Cl. 68—19.1 5 Claims



1. An apparatus for treating tubular fabric, including a liquid treatment impregnation bath, means for passing the fabric through said bath, squeeze rollers for removing excess treating liquid from the fabric as it exits from the treatment bath, a first sieve drum, roller means for passing the tubular fabric over the first sieve drum, spray means for spraying rinse liquid onto the fabric as it passes over the first sieve drum, a second sieve drum downstream of the first sieve drum, means for passing the fabric above the second sieve drum and returning it in the opposite direction over and in contact with the second sieve drum such that the fabric has been reversed to expose the other surface thereof, spray means for spraying rinsing liquid onto the fabric as it passes over the second sieve drum, means for passing the fabric underneath the second sieve drum, and means for removing the excess rinsing liquor from the fabric.

4,068,502
APPARATUS FOR MULTICOLOR DYEING OF TEXTILE YARNS

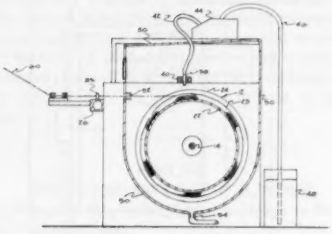
Harald Anderson, 18 King's Hill Court, Summit, N.J. 07901

Filed Aug. 6, 1976, Ser. No. 712,186
Int. Cl.[2] D06B *1/02*
U.S. Cl. 68—27 8 Claims

1. Improved apparatus for the high speed, multicolor dyeing of a yarn strand comprising:
a. a rotatable drum having end flanges and a central barrel portion for collecting a running length of yarn in a plurality of layers thereon;
b. means positioned in outwardly spaced relation from the surface of the barrel and extending along the barrel length between said end flanges for continuously directing a row

of discrete, cohesive streams of dye against the outer surface of the yarn on said barrel to form narrow adjacent radial bands of color in the yarn layers during rotation of the drum;

c. means for guiding a yarn strand onto the barrel surface while traversing the strand along the length of the barrel between said end flanges to sequentially locate desired lengths of the yarn strand in each of said radial bands of color during rotation of the drum;



d. means for rotating the drum at a predetermined high rate of speed to produce centrifugal force sufficient to cause radial outward flow of dye from inner layers of the yarn in each of said bands of color to penetrate the inner surfaces of outer yarn layers on the barrel; and

e. shield means completely surrounding the outer yarn receiving surface of the barrel in spaced relation therefrom for continuously collecting excess dye centrifugally expelled from the surface of the yarn on the drum during winding and having a yarn entrance slot located therein.

4,068,503

COMBINED OSCILLATING AND UNIDIRECTIONAL AGITATOR FOR AUTOMATIC WASHER

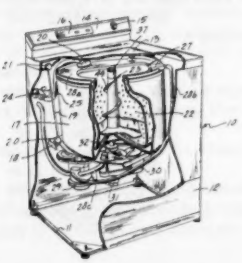
Clark I. Platt, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 595,792, July 14, 1975, Pat. No. 3,987,651, which is a continuation of Ser. No. 418,378, Nov. 23, 1973, abandoned. This application June 16, 1976, Ser. No. 696,746

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.[2] D06F *13/06*

U.S. Cl. 68—133 **17 Claims**



1. An agitator assembly for a clothes washing machine comprising:

a first agitator element,

a second agitator element,

drive means for driving said first agitator element in an oscillatory motion and for concurrently driving said second agitator element in an unidirectional rotary motion, said first and second agitator elements cooperating to circulate the contents of the machine in a toroidal rollover pattern within the washing machine, and

means associated with said second agitator element for forcing articles adjacent thereto into the oscillatory path of said first agitator element and into said rollover pattern, said first agitator element having formed thereon flexible vanes which are free to flex in response to oscillatory motions of the agitator element, thereby to yieldingly engage fabrics deflected downwardly and lessening high impact loading of the first agitator element.

4,068,504

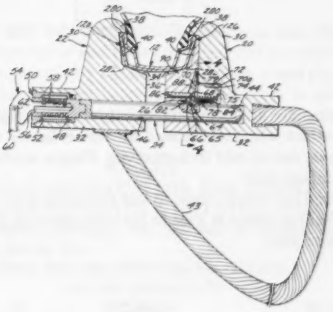
BICYCLE LOCK

Frank W. Pickard, Inglewood, Calif., assignor to Eleanor D. J. Stanford, Inglewood, Calif., a part interest

Filed July 26, 1976, Ser. No. 708,748

Int. Cl.[2] E05B *73/00*

U.S. Cl. 70—18 **8 Claims**



1. A bicycle lock, comprising:

a pair of jaws for gripping opposite sides of a rim of a spoked wheel in a direction generally parallel to an axle of said wheel, at least one of said jaws supporting a projection for engaging a fork-like frame member supporting the said axle when said jaws are affixed in place on said rim to limit rotation of said wheel, said jaws including coaxial holes;

a connecting shaft turnable in said coaxial holes in said jaws, axially fixed relative to a fixed one of said jaws, and axially slidable in the hole in a movable one of said jaws; and

cooperative means on said movable jaw and connecting shaft for (a) driving said movable jaw toward said fixed jaw and for (b) releasably locking said movable jaw against axial movement on said shaft away from said fixed jaw as said shaft is turned to a preselected rotational position relative to said movable jaw.

4,068,505

LOCKING DEVICE

Kenneth Q. Volk, Jr., San Marino, Calif., assignor to Public Storage, Inc., Pasadena, Calif.

Filed Feb. 25, 1977, Ser. No. 772,027

Int. Cl.[2] E05B *67/38;* **E05C** *1/04, 13/02*

U.S. Cl. 70—56 **8 Claims**

1. Locking means including a base plate and a cover plate hinged thereto, the base plate including:

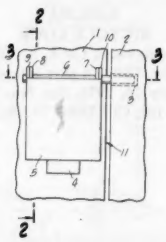
flanges extending laterally from opposite sides of said base plate, each base plate flange including an aperture near one end of said base plate, the apertures lying at least partly in the same plane, and means for joining the locking means to a first surface;

the cover plate including flanges extending laterally from opposite sides of said cover plate, each cover plate flange including an aperture near one end of said cover plate, said apertures lying at least partly in the same plane;

the cover plate flanges alone, the base plate flanges alone, or both together bridging the spaces between the edges of base and cover plates on said opposite sides;

said base plate and cover plate each including a lock-receiving flange on its inner surface, each lock-receiving flange including a lock-receiving aperture, said lock-receiving apertures lying at least partly in the same plane when said cover plate is closed against said base plate;

first bar means passing through the apertures in the base plate and cover plate flanges and joining the plates



hingedly and being sufficiently long to engage a second surface when said second bar means lies on the side of at least one of said lock-receiving flanges nearer the second surface; and

second bar means joined to and extending laterally from said first bar means at least to the lock-receiving flange on said base plate.

4,068,506

HIDDEN LOCK

Robert A. Phelps, 220 Granlan Road, Baltimore, Md. 21228

Filed Nov. 5, 1976, Ser. No. 739,036
Int. Cl.[2] E05B *65/08;* E05C *19/18*
U.S. Cl. 70—100 **4 Claims**

1. A concealed lock for panels such as windows and doors that have adjoining portions when the panels are in closed position, and when closed having an aligned opening extending from one panel to the other, comprising:

a symmetrically formed hollow sleeve member slidably insertable without rotation and removable from said aligned opening, either end first, with the entire sleeve being concealed inside the aligned opening,

a key member insertable into said concealed hollow sleeve and easily and quickly interengageable and disengageable with the sleeve at the closest end to remove the sleeve member and unlock the panels,

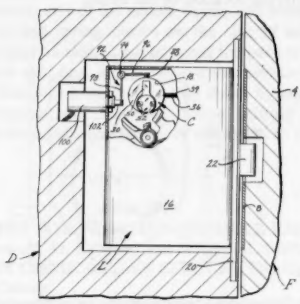
said hollow sleeve member having engageable means near each opposite end, and said key having coacting means for easily engaging said sleeve member at either end when inserted into the concealed sleeve, despite the angular orientation of the key with respect to the sleeve.

4,068,507

LIMITED ACCESS LOCK

Francis C. Peterson, St. Louis County, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Filed Aug. 11, 1976, Ser. No. 713,275
Int. Cl.[2] E05B *27/04, 43/00*
U.S. Cl. 70—271 **13 Claims**



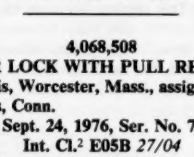
1. In a lock including a case and a bolt in the case, improved key operated means for retracting the bolt on a selective basis, said means comprising: a member having a bore therein; a core in the bore and being capable of receiving a first key, the core having a hole therein; first means in the member for engaging the core and preventing the core from rotating when the key is out of the core and being disengaged from the core by the key when the key is inserted into the bore; second means engageable with the core for preventing rotation of the core irrespective of whether or not the first key is in the core, the second means including a push rod which will project into the hole of the core and prevent the core from rotating when the core is in the proper position of rotation and a spring urging the push rod away from the core; and actuating means for controlling the position of the push rod, the actuating means when energized overcoming the force exerted on the push rod by the spring and urging the push rod toward the core.

4,068,508

PIN TUMBLER LOCK WITH PULL RESISTANT PLUG

Joseph M. Genakis, Worcester, Mass., assignor to Benjamin D. Pollack, Morris, Conn.

Filed Sept. 24, 1976, Ser. No. 726,208
Int. Cl.[2] E05B *27/04*
U.S. Cl. 70—364 A **9 Claims**



1. A cylinder lock comprising:

a lock housing defining a circularly cylindrical bore and a plurality of housing pinways;

a circularly cylindrical sleeve means rotatably mounted in said bore and having a circularly cylindrical passage with a central axis eccentric to the axis of said bore, said sleeve means defining a plurality of sleeve pinways aligned with said housing pinways;

a cylindrical plug rotatably mounted in said passage and defining a longitudinally extending keyway, said plug further defining a plurality of transversely extending plug

pinways intersecting said keyway and aligned with said sleeve pinways;

a plurality of stacked pins longitudinally movable within each set of said aligned housing, sleeve and plug pinways;

bias means forcing said stacked pins toward said keyway;

rotational coupling means limiting rotation of said plug within said passage; and

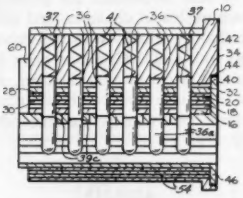
longitudinal coupling means for preventing longitudinal movement of said plug and said sleeve means with respect to said housing, said coupling means comprising selective keying means engaging said plug and said sleeve means so as to prevent relative longitudinal movement therebetween while allowing relative rotational movement therebetween and further comprising external recesses in the outer surface of said sleeve means and coincident with said sleeve pinways, said external recesses being longitudinally spaced apart on the outer surface of said sleeve means.

4,068,509

PIN TUMBLER LOCK CYLINDER

Joseph M. Genakis, Worcester, Mass., assignor to Benjamin D. Pollack, Morris, Conn.

Continuation of Ser. No. 579,040, May 19, 1975, abandoned.
This application July 19, 1976, Ser. No. 706,935
Int. Cl.[2] E05B *27/04*
U.S. Cl. 70—364 A **15 Claims**



1. A cylinder lock comprising:

a lock housing defining a circularly cylindrical bore and a plurality of housing tumbler-ways;

a circularly cylindrical sleeve means rotatably mounted in said bore and having a circularly cylindrical passage with a central axis eccentric to the axis of said bore, said sleeve means defining a plurality of sleeve tumbler-ways aligned with said housing tumbler-ways;

a cylindrical plug rotatably mounted in said passage and defining a longitudinally extending keyway, said plug further defining a plurality of transversely extending plug tumbler-ways intersecting said keyway and aligned with said sleeve tumbler-ways;

a plurality of stacked tumblers longitudinally movable within each set of said aligned housing, sleeve and plug tumbler-ways;

bias means forcing said stacked tumblers toward said keyway; and

coupling means substantially preventing rotation of said plug within said passage so as to limit lock opening movement of said plug to an orbital path about the axis of said bore.

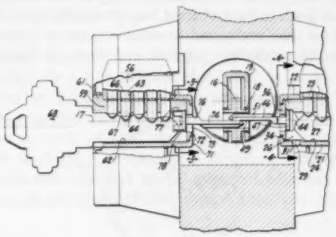
4,068,510

DOUBLE CYLINDER SAFETY LOCK

Ralph E. Neary, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed June 28, 1976, Ser. No. 695,304
Int. Cl.[2] E05B *9/10*
U.S. Cl. 70—379 R **9 Claims**

1. A safety lock comprising a bolt, means including a hub rotatable about an axis and having a non-circular hole therein for moving said bolt between a projected position and a retracted position, a plug rotatable about said axis and including means defining a keyway in said plug along said axis, means depending upon the rotary position of said plug for retaining a key in said plug, an actuator at one end disposed in said plug and extending along said axis and occupying only a portion of



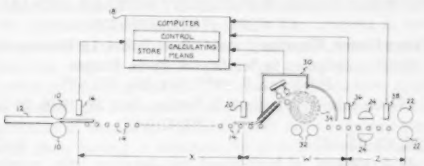
said hole in said hub, a lost-motion device on said plug for connecting one end of said rotary plug and said one end of said actuator and operable by a key in said keyway in said plug, and a direct device for immediately connecting a key in said keyway in said plug and said end of said actuator.

4,068,511

METHOD AND APPARATUS FOR BAR TEMPERATURE DETERMINATION IN A HOT STRIP MILL

George P. Petrus, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Mar. 15, 1977, Ser. No. 777,618
Int. Cl.[2] B21B *37/10*
U.S. Cl. 72—13 **14 Claims**



1. In a continuous hot strip mill system including a first rolling mill, a second rolling mill and an intermediate delay table having an open portion and a coiler portion, means for determining the temperature of a bar being rolled comprising:

a. means to determine the bar temperature as it emerges from the first rolling mill;

b. means to determine the amount of time the bar remains on the open portion of the delay table;

c. means to determine the amount of time the bar remains in said coiler portion; and,

d. computer means including calculating means for calculating the temperature of the bar as it enters the second rolling mill as a function of the determined times and the bar temperature as it exited the first rolling mill.

4,068,512

APPARATUS AND METHODS FOR FORMING MULTIPLE ELONGATED PRODUCTS

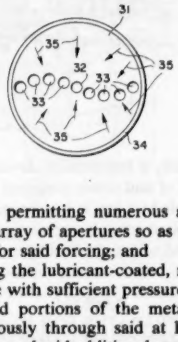
Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,493
Int. Cl.[2] B21C *23/01, 23/08, 23/32*
U.S. Cl. 72—41 **10 Claims**

1. Apparatus for deforming a lubricant-coated, metallic workpiece to produce simultaneously a plurality of elongated, metallic products, said apparatus comprising:

a die having a plurality of discrete apertures extending in

parallel therethrough, including at least one generally central aperture and a plurality of additional apertures, said at least one generally central aperture being located closer to a center of the die than is each of said additional apertures, said plurality of discrete apertures being arrayed along an open-ended curve selected to promote a free flow of the lubricant coating on the metallic workpiece both to said at least one generally central aperture and to said additional apertures upon a forcing of said metallic workpiece against and through the die, while



simultaneously permitting numerous apertures to be included in the array of apertures so as to reduce the pressure required for said forcing; and

means for forcing the lubricant-coated, metallic workpiece against said die with sufficient pressure to cause different lubricant-coated portions of the metallic workpiece to pass simultaneously through said at least one generally central aperture and said additional apertures while applying the lubricant coating to each of said generally central and additional apertures, such that a plurality of elongated, metallic products is produced.

4,068,513

METHOD OF DRAWING LIGHT METALS AND ALLOYS AT VERY HIGH SPEEDS

Pierre Guerit, Chambery, and Gilbert Pollet, La Rivoire, both of France, assignors to Servimetal, Paris, France

Filed Jan. 7, 1977, Ser. No. 757,607
Claims priority, application France, Jan. 28, 1976, 76 02852
Int. Cl.[2] B21C *9/02*
U.S. Cl. 72—42 **3 Claims**

1. A method of high-speed hot drawing light metals and alloys, particularly aluminum, magnesium and alloys based on aluminum or magnesium, comprising the steps of drawing the metal through a draw die and lubricating the die by interposing between the metal and the die a vitreous substance having a viscosity within the range of 10^3–10^4 poises at a temperature within the range of 400°–650° C, in which the vitreous substance consists essentially of 25.6 to 68.3% by weight P_2O_5, 1.7 to 53% by weight B_2O_3 and up to 38.9% by weight Na_2O.

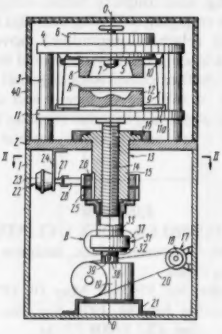
4,068,514

DEVICE FOR ELECTROHYDRAULIC DIE-FORGING

Viktor Nikolaevich Chachin, bulvar Lunacharskogo, 8, kv. 21; Jury Efimovich Sharin, ulitsa Ya. Kolasa, 43, korpus 1, kv. 18; Gennady Nikolaevich Zdor, ulitsa V. Khoruzhei, 19, kv. 14; Vladimir Leontievich Shaduya, ulitsa Pervomaiskaya, 8, kv. 7, and Alexandr Julyanovich Zhuravsky, prospekt Partizansky, 28, korpus 2, kv. 135, all of Minsk, U.S.S.R.

Filed July 12, 1976, Ser. No. 704,178
Int. Cl.[2] B21D *26/02*
U.S. Cl. 72—56 **3 Claims**

1. A device, for electrohydraulic die-forging of a blank, having a bed and at least two parallel columns secured on said bed; said device comprising a first plate rigidly secured on said columns; an explosion chamber located on said plate and adapted to contain a fluid; a power source; an electrode arranged in said explosion chamber and connected electrically to said power source; a wall of said explosion chamber serving as a second grounded electrode; a die supporting said blank mounted on another or second plate set parallel to said first plate and adapted to move towards and away from said first plate along said columns for moving said die and blank and pressing same against said explosion chamber in the course of die-forging; a mechanism for moving said second plate and pressing it against said explosion chamber being in the form of a kinematic screw-and-nut pair; said mechanism comprising a progressively moving element rigidly connected with said second plate; a rotatable element mounted on said bed; a drive



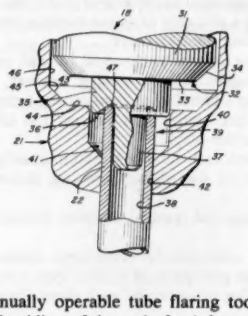
system for progressively moving said second plate; and independent drive of said mechanism for pressing said die and blank against said explosion chamber; and said rotatable element being linked kinematically with said drive system of said second plate and with said independent drive for pressing said die and blank against said explosion chamber, whereby said die and blank are brought into contact with the explosion chamber and pressed thereagainst by the action of said drive system and said independent drive.

4,068,515

FLARING TOOL

Leonard J. Kowal, Prospect Heights, and Edward N. Garvey, Schaumburg, both of Ill., assignors to Gould Inc., Chicago, Ill.

Filed Feb. 7, 1977, Ser. No. 767,642
Int. Cl.[2] B21D *19/16*
U.S. Cl. 72—115 **15 Claims**



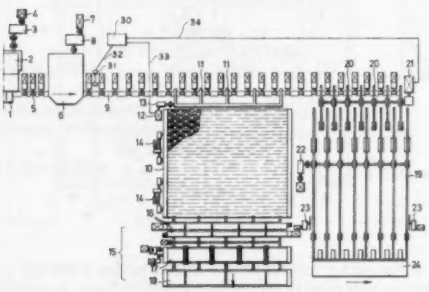
1. A manually operable tube flaring tool for providing a controlled buckling of the end of a deformable tube to form a partial double flare therein, said tool comprising: a flaring head defining a frustoconical flaring surface and a cylindrical pilot portion projecting axially from said flaring surface to be received in the tube end for guiding the flaring surface axially against the distal end of the tube, said flaring surface extending radially substantially the entire radial dimension of the flaring head radially outwardly of the pilot portion; a support for fixedly positioning said tube end coaxially adjacent said flaring surface, said support defining a cylindrical recess coaxially confronting said flaring surface and including an axially outer right circularly cylindrical portion having an inner diameter

slightly greater than that of the large end of said flaring surface for slidably guiding the flaring head during a flaring operation, an axially inner frustoconical, outwardly widening portion opening coaxially into said outer portion, and an axially innermost tube clamping right circularly cylindrical portion; force transmitting means for forcibly urging the flaring head axially inwardly against said distal end of the tube secured by said clamping portion, the angularity of said frustoconical portion being preselected to allow said tube end to buckle radially outwardly to have an axially inner portion abut said frustoconical portion of the support and an axially outer portion adjacent said distal end about said flaring surface of the flaring head; and stop means for positively limiting inward movement of the flaring head relative to said support for assuring an accurately preselected buckled partial double flare configuration of the tube end, said stop means including an annular, inwardly facing planar stop surface on said flaring head outwardly adjacent said flaring surface, and a complementary annular outwardly facing planar stop surface on said support outwardly adjacent said outer recess portion.

4,068,516
METHOD AND APPARATUS FOR HANDLING BAR-SHAPED MATERIAL

Rudolf Wonisch, Mailand, Italy, assignor to Firma Friedrich Kocks, Dusseldorf, Germany

Filed Nov. 18, 1976, Ser. No. 742,869
Int. Cl.² B21B *43/00*
U.S. Cl. 72—201 **14 Claims**



1. A method of handling bar-shaped material, such as tubes, beyond a plant for at least one of manufacturing and machining the same, comprising the steps of sub-dividing the material moving out of the plant by means of a severing device, sorting the cut lengths of material into at least two groups, each group of generally similar character, feeding said sorted lengths to at least two spaced cooling beds, one group to each bed, conveying the cut lengths from the first cooling bed and subjecting them to substantially automatic continuous after-processing and conveying the cut lengths from the second cooling bed, after intermediate storage subjecting them at the second cooling bed to at least partially manual individual after-processing.

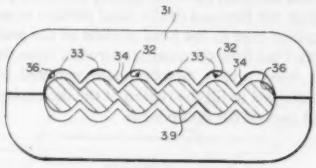
4,068,517
METHODS AND APPARATUS FOR FORMING WIRE TAPES

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,467
Int. Cl.² B21C *23/02, 25/02*
U.S. Cl. 72—253 R **11 Claims**

1. A method of hydrostatic extrusion for deforming an elongated workpiece so as to form an integral article, which article comprises a plurality of elongated members, each of substantially circular cross-section, extending longitudinally in parallel while arrayed in a substantially laterally extending line, and joined together in edge-to-edge contact substantially along parallel, longitudinally extending lines of tangency between adjacent elongated members, the method comprising the steps of:

a. applying hydrostatic forces to the elongated workpiece in such direction as to extrude the elongated workpiece through first die aperture wall means, having a fixed configuration and shaped to deform the elongated workpiece into an intermediate structure, which intermediate structure comprises a plurality of elongated elements extending in a longitudinal direction, in parallel, while arrayed in a substantially laterally extending line, and joined together along adjacent lateral edges of adjacent elements, each of said elements having a cross-section which includes a substantially circular, arcuate portion between said adjacent lateral edges of adjacent elements and a non-circular, junction region generally converging



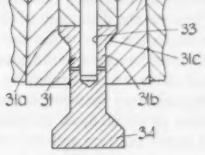
toward each of said adjacent lateral edges of adjacent elements; and thereafter

b. further extruding said intermediate structure, by means of said hydrostatic forces, through second die aperture wall means, having a fixed configuration and shaped to compress said intermediate structure substantially laterally, along the substantially laterally extending line in which the plurality of elongated elements are arrayed in said intermediate structure, to round out said non-circular, junction regions in such manner as to form an integral article comprising a plurality of elongated members, equal in number to the number of elongated elements in said plurality of elongated elements, with the elongated members each having a substantially circular cross-sectional shape, and being joined together along adjacent lateral edges of adjacent elongated members.

4,068,518
METHOD OF MANUFACTURING AN EXTRUDED STEEL COMPONENT

Ian Anthony Dockerill, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 17, 1976, Ser. No. 687,209
Claims priority, application United Kingdom, May 20, 1975, 21376/75
Int. Cl.² B21D *22/00*
U.S. Cl. 72—354 **8 Claims**



1. A method of manufacturing an extruded steel component, including the steps of:

a. producing a steel preform which defines a shank part of a required component and which includes a hollow head

portion tapering inwardly to the shank part, the external diameter of the head portion being substantially equal to the external diameter of the head part of the required component, but the bore in the head portion having a diameter less than that required for said head part, and

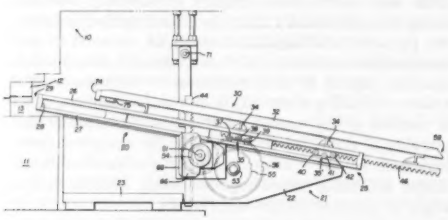
b. positioning the preform in a die cavity of the shape of the required component, and performing an extrusion operation on the head portion of the preform using a punch including inner and outer, relatively movable punch members, the inner punch member defining the shape of the wide portion of said bore in the required component and the head part of the outer punch member defining the shape of the free end of the required component, the extrusion operation comprising moving the inner punch member relative to the outer punch member and the die cavity so as to enter said head portion and produce said wide bore portion and a cam surface on the wall of the bore in the head part, and urging the outer punch member against the free end of the head portion to apply a predetermined load to the head portion of the preform so as to restrict the flow of material extruded from the preform by said inner punch member, said material thereby being constrained to fill the region of the die cavity defining the head part of the component.

4,068,519

UNLOADER FOR PRESS

B. E. Baringer, West Bloomfield, Mich., assignor to Kasle Steel Corporation, Detroit, Mich.

Filed Jan. 5, 1976, Ser. No. 646,125
Int. Cl.[2] B21D *45/04;* B26D *7/18*
U.S. Cl. 72—426 **4 Claims**



1. In an unloader to be attached to a press or the like, the press including a reciprocable ram having a lower position for forming workpieces in a die area and having an upper position where said formed pieces are released or dropped such as by a positive knock out or the like, said ram being driven between said upper and lower positions as is conventional, and an automatic workpiece unloader to be driven by the movement of the ram including a drive rack to be attached to said reciprocable ram for positive synchronized reciprocation therewith;

a stationary support frame having a distal end extending into said die area, said frame at all times being free from contact with said ram;

a tray movably mounted on said stationary support frame, said tray having an extended position with the distal end of the tray beyond the distal end of the frame into the die area and beneath the ram when the ram is in its upper position, said tray having a withdrawn position out of the die area; and drive means driven by said drive rack for reciprocating said tray between its extended position and its withdrawn position upon reciprocation of said ram between its upper position and its lower position, respectively;

so that during movement of the ram toward its upper position, the tray is moved toward its extended position under the ram to receive a falling workpiece as the workpiece is released by the press and during movement of the ram toward its lower position the tray is moved toward its withdrawn position clear of the moving ram, the improvement comprising:

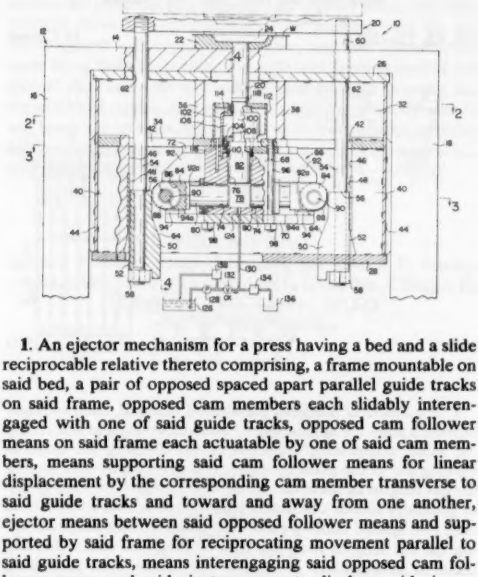
one pair of spaced apart rails on each side of said stationary support frame, each pair including an upper rail and a lower rail defining a single track therebetween; roller means positioned in each single track; said tray mounted on said roller means; and said roller means includes first and second sets of three rollers each, said first set of rollers including two rollers contacting only the lower rail and the third roller contacting only the upper rail and said second set of rollers having two rollers contacting only said upper rail and the third roller contacting only said lower rail, said rollers contacting the rails for constraining the tray to linear movement parallel to the longitudinal axis of said rails, and to prevent bouncing of the tray when workpieces are dropped on the tray.

4,068,520

CAM ACTUATED EJECTOR MECHANISMS FOR PRESSES

Louis F. Carrieri, LaGrange Park, Ill., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed May 13, 1976, Ser. No. 686,448
Int. Cl.[2] B21D *45/02, 45/04;* F16H *25/18*
U.S. Cl. 72—427 **11 Claims**



1. An ejector mechanism for a press having a bed and a slide reciprocable relative thereto comprising, a frame mountable on said bed, a pair of opposed spaced apart parallel guide tracks on said frame, opposed cam members each slidably interengaged with one of said guide tracks, opposed cam follower means on said frame each actuatable by one of said cam members, means supporting said cam follower means for linear displacement by the corresponding cam member transverse to said guide tracks and toward and away from one another, ejector means between said opposed follower means and supported by said frame for reciprocating movement parallel to said guide tracks, means interengaging said opposed cam follower means and said ejector means to displace said ejector means in response to displacement of said follower means, and means interconnecting said cam members and said slide, whereby reciprocation of said slide displaces said cam members relative to said frame for said cam follower means to displace said ejector means relative to said frame.

4,068,521

ULTRASONIC AIR AND BLOOD FOAM DETECTOR

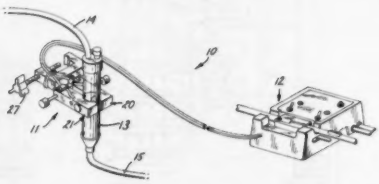
Louis C. Cosentino, Wayzata, and LeRoy J. Fischbach, Minneapolis, both of Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed July 22, 1976, Ser. No. 707,485
Int. Cl.[2] G01N *7/00*
U.S. Cl. 73—19 **17 Claims**

10. An ultrasonic air and blood foam detector for use with a blood tube system including a drip chamber, comprising:

a. an ultrasonic sensor assembly including a pair of sensor

body members, means slideably interconnecting said members for permitting relative motion of said members towards and away from each other, said sensor body members configured to form a drip chamber receiving area therebetween, and an ultrasonic transducer crystal mounted in at least one of said body members and positioned for contacting the side of a blood drip chamber when positioned in said receiving area;



b. energization means connected to said sensor assembly for causing ultrasonic energy to be transmitted through said blood drip chamber; and

c. electronic signal level detection means operatively connected to said sensor assembly for receiving signals transmitted through said blood drip chamber and operable in response to the signal level of the received ultrasonic signals to produce an output signal indicative of the presence of air or blood foam in said chamber.

4,068,522

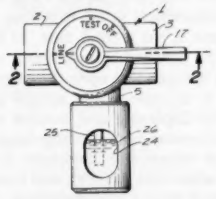
GAS LEAK DETECTOR

Lloyd Richard Poe, Long Beach, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Continuation-in-part of Ser. No. 693,754, June 8, 1976, abandoned. This application Jan. 5, 1977, Ser. No. 757,080

Int. Cl.² G01M *3/08*

U.S. Cl. 73—40.5 R **3 Claims**



1. A leak detector for a fluid discharge system, comprising:

a. a valve body including a main inlet for connection to a fluid supply, a main outlet for connection to a fluid discharge system, and a valve chamber therebetween;

b. a manually operable plug valve rotatably mounted in the valve chamber, and having a transverse main flow passage connecting the main inlet and main outlet;

c. a handle for manually rotating the plug valve;

d. a leak detecting means including a chamber underlying the plug valve and containing a liquid exposed for observation;

e. a first pressure sensing passage extending between the main inlet through the plug valve to the leak detecting means;

f. and a second pressure sensing passage extending between the leak detecting means and the main outlet;

g. the plug valve being movable between an ON position in which the main flow passage connects the main inlet and outlet; and a TEST position wherein the main flow passage is isolated from the main inlet and outlet, and the first and second pressure sensing passages interconnect the main inlet and outlet through the leak detecting means for observation of the state of the liquid in its chamber;

h. means for limiting rotation of the plug valve between its ON position and its TEST position; and

i. spring means engaging the plug valve to yieldably urge the plug valve from its TEST position to its OFF position.

4,068,523

NON-DESTRUCTIVE TESTING

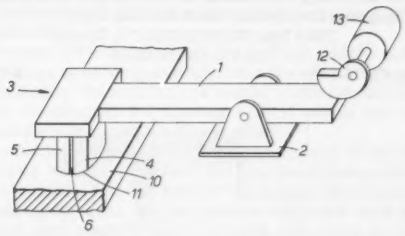
Matthew J. Hetherington, Near Market Harborough; Richard Lewis, Rushden, and Graham E. Goode, Corby, all of England, assignors to British Steel Corporation, London, England

Filed Dec. 23, 1975, Ser. No. 643,685

Claims priority, application United Kingdom, Dec. 31, 1974, 56193/74

Int. Cl.² G01N *29/04*

U.S. Cl. 73—628 **15 Claims**



1. Apparatus for the non-destructive testing of articles comprising a head mounted for reciprocating movement; ultrasonic testing transducer means mounted on the head; means for reciprocating the head such that in use the head is caused to impact upon the article to be tested with an impulsive blow of short dwell time once during each reciprocation of the head; and means for actuating the transducer means for testing operation by the transmission of pulses and the reception of pulse echoes through the contacting area of the head and the article to be tested during the dwell time of each impact.

4,068,524

ULTRASONIC INSPECTION OF ARTICLES

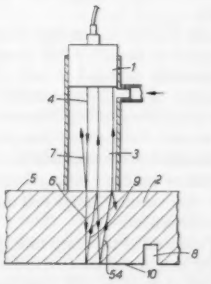
Richard Lewis, Rushden, and Michael J. Parker, Kettering, both of England, assignors to British Steel Corporation, London, England

Filed May 11, 1976, Ser. No. 685,159

Claims priority, application United Kingdom, May 14, 1975, 20402/75

Int. Cl.² G01N *29/04*

U.S. Cl. 73—598 **16 Claims**



1. A method of ultrasonically inspecting an article comprising transmitting a succession of ultrasonic pulses into the arti-

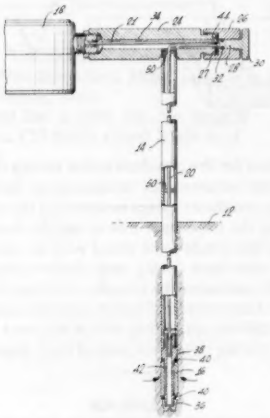
cle; for each transmitted pulse, detecting and registering electrically the reflected pulse from the front surface of the article; detecting and registering electrically, with a predetermined gain, any reflected pulses indicative of faults or discontinuities within the article; detecting and registering electrically, again with a predetermined gain, at least the first reflected pulse from the rear surface of the article; monitoring the amplitudes of the registered reflected pulse from the front surface and at least the first reflected pulse from the rear surface of the article; and continuously controlling gains for succeeding pulses in dependence on the amplitude of the reflected pulse from the front surface of the article.

4,068,525

PORTABLE TENSIOMETER FOR SOIL MOISTURE MEASUREMENT

Percy E. Skaling, Santa Barbara, Calif., assignor to Soilmoisture Equipment Corporation, Santa Barbara, Calif.

Filed Sept. 20, 1976, Ser. No. 724,628
Int. Cl.[2] G01N *25/56*
U.S. Cl. 73—73 **8 Claims**



2. A portable tensiometer for measuring soil moisture content, comprising:

an elongated housing tube having a hollow porous tip secured to one end to be inserted in the soil, the interior of said porous tip in part defining the walls of a first chamber inside said tube;

a handle element secured to the end of said housing tube remote from said porous tip, said handle element having a bore therein communicating with the interior of said housing tube;

a vacuum gauge secured to one end of said handle element;

a cylinder secured to the other end of said handle element;

a plunger adjustable engaged in said cylinder to form a second chamber of adjustable volume;

a first section of capillary tubing connecting said first chamber to said second chamber and disposed within said housing tube and said bore of said handle element; and

a second section of capillary tubing connecting said second chamber to said vacuum gauge and disposed in said bore of said handle element;

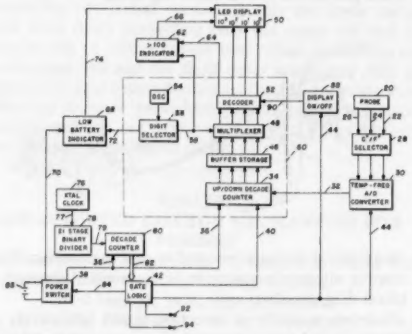
whereby said sections of capillary tubing minimize the volume of water in said tensiometer and minimize errors due to differential expansion and contraction of the water caused by temperature changes, and whereby said plunger is adjustable within said cylinder in order to converge upon a stable vacuum gauge reading more rapidly.

4,068,526

ELECTRONIC THERMOMETER

Harold Goldstein, Westbury, N.Y., assignor to Control Electronics Co., Inc., Farmingdale, N.Y.

Filed July 29, 1975, Ser. No. 599,971
Int. Cl.[2] G01K *7/24*
U.S. Cl. 73—362 AR **23 Claims**



1. An electronic thermometer for producing an estimated final temperature consisting of a means for taking temperature measurements including a temperature responsive element, a means for transforming at first and second predetermined, discrete times said measurements into signals having a variable pulse rate determined by the measured temperatures, a counter means for operating upon said signals in accordance with the algorithm

$$T_F = \frac{T_2 - (T_1)e^{-\frac{\Delta t}{\tau}}}{1 - e^{-\frac{\Delta t}{\tau}}}$$

wherein T_F is the final temperature being measured, T_1 is the temperature measurement at the first time, T_2 is the temperature measurement at the second time, Δt is the difference in time between the first and second times, τ is a thermal time constant which is dependent upon the temperature responsive element and e is the base of the natural log, and means for visually digitally displaying said counter means results, said electronic thermometer further comprising:

control means electrically connected to said transforming means for selectively enabling said transforming means at said first and second predetermined, discrete times and electrically connected to said counter means for controlling said counter to count the pulses of said signals having a variable pulse rate in accordance with said algorithm.

4,068,527

TRANSDUCER

Ernest M. Jost, Plainville; Arthur L. Reenstra, Attleboro, both of Mass., and George Trenkler, East Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 427,943, Dec. 26, 1973, Pat. No. 3,940,992.
This application Dec. 3, 1975, Ser. No. 637,482
Int. Cl.[2] G01L *9/10*
U.S. Cl. 73—704 **6 Claims**

1. A vacuum transducer comprising:

a casing means having first and second portions, the first portion formed of magnetic material having an open end,

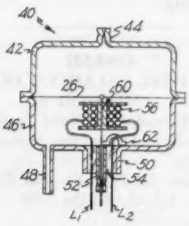
a diaphragm formed of magnetic material hermetically sealed to and closing said open end,

a thin wire member having first and second ends and having a longitudinal axis therebetween composed of magnetic material mounted in said first portion of the casing with said first end atttached to said diaphragm and said second

end fixed relative to said first portion of the casing, the member adapted to be placed under tension,

an electrical coil disposed within said first portion of the casing about the member intermediate the ends thereof,

an egress formed in said first portion of the casing and connectable to a vacuum to be measured,



the second portion of the casing having an open end which mates with and is hermetically sealed to the first portion with the diaphragm interposed therebetween and which includes means for providing a reference vacuum in the second portion of the casing, the member being placed in tension when the second portion of the casing is evacuated, and

means to energize said coil.

4,068,528

TWO POSITION ROTARY VALVE FOR INJECTING SAMPLE LIQUIDS INTO AN ANALYSIS SYSTEM

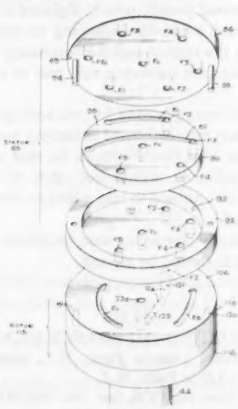
Richard Gundelfinger, Oakland, Calif., assignor to Rheodyne Incorporated, Berkeley, Calif.

Continuation-in-part of Ser. No. 650,469, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 609,394, Sept. 2, 1975, Pat. No. 3,961,394. This application Apr. 13, 1976, Ser. No. 676,424

The portion of the term of this patent subsequent to Aug. 8, 1993, has been disclaimed.

Int. Cl.[2] G01N *1/10*

U.S. Cl. 73—422 GC **16 Claims**



1. For use with a source of liquid from which liquid flows at a first pressure to a liquid receiver a rotary valve positionable in either a first position definable as a load position or a second position definable as an inject position, for injecting a liquid sample into the stream of liquid from said source to said receiver, the valve comprising:

a stationary stator including a plurality of external ports and a corresponding plurality of internal liquid flow paths in communication with said ports said ports including a pair of ports connectable to said source and receiver, and further including a group of *n* ports, where *n* is an integer not less than 3;

an external conduit defining a sample loop through which liquid is adapted to flow, said conduit being of a selected length and internal diameter and being connected to first and second of said *n* ports, said *n* ports including a third port exposed to a second pressure less than said first pressure;

rotor means rotatable with respect to said stator about a selected axis to thereby position said valve in either said load or inject position, and including a cavity having first and second open ends, said first open end being in flow communication with said first external port irrespective of the valve position, said rotor means further including a plurality of rotor flow passages for providing a liquid flow path between the stator flow paths in communication with said second and third ports, only when the valve is in said load position and for providing a liquid flow path between the pair of ports to which said source and receiver are connected through said cavity and said sample loop, when said valve is in the inject position;

seal means for sealing the cavity second end, said seal means defining an opening accessible from the valve exterior for facilitating the insertion of a syringe needle into said cavity therethrough for injecting a liquid sample into said sample loop through said cavity; and

plug means for effectively closing the opening of said seal means, said seal means with said plug means being adapted to withstand said first pressure when liquid flows through said cavity at said selected pressure when said valve is in said inject position, said plug means comprising an elongated wire having a front portion thereof insertable into said cavity through the seal means opening to thereby close the latter, and a lockable plug holder connected to the wire end opposite the front portion which is insertable into said cavity.

4,068,529

METHOD AND APPARATUS FOR AUTOMATICALLY PERFORMING SERIES ANALYSES

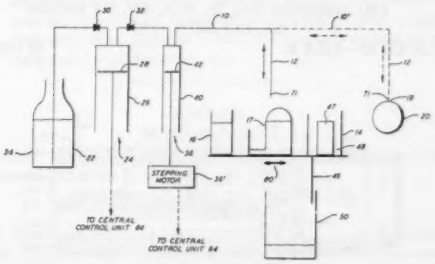
Eberhard Konig, Uberlingen, Germany, assignor to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Bodensee, Germany

Filed Jan. 19, 1977, Ser. No. 760,568

Claims priority, application Germany, Jan. 24, 1976, 2202675

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—423 A **23 Claims**



1. A method for making successive measurements with an analyzer comprising, for each complete cycle of operation, in controlled sequence, the steps of:

picking up with a single stepwise movable metering probe, in a first measuring cycle, a sample for measurement from a sample container and a small volume of air;

introducing said sample and the small volume of air into the inlet of said analyzer;

picking up with said metering probe, in a secondary measuring cycle, a sample for measurement from said sample

container and a small volume of air, and picking up with said metering probe a metered quantity of liquid additive and a second small volume of air;

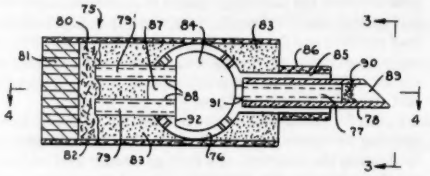
introducing said sample, said liquid additive and said air picked up in said secondary measuring cycle into the inlet of said analyzer.

4,068,530

DEVICE AND METHOD FOR OBTAINING ONE OR MORE SAMPLES OF LIQUID

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Division of Ser. No. 543,687, Jan. 24, 1975, Pat. No. 4,002,071.
This application May 3, 1976, Ser. No. 682,563
Int. Cl.[2] G01N *1/12*
U.S. Cl. 73—425.4 R **5 Claims**



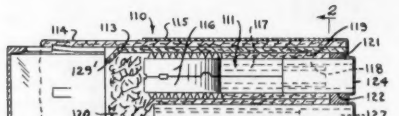
1. Structure constituting a subassembly of a device for obtaining a sample of molten material, said subassembly comprising a pair of half sections, each of said sections having a head provided with a recess and an extended portion provided with a groove, said head of each section also having a relatively thick portion provided with a pair of grooves spaced from the grooves in the extended portions, the arrangement being such that when the sections are correctly assembled, said recesses and grooves in said extended portions will form a primary chamber and an opening leading thereto and said grooves in said thick portions will form a pair of openings, a pair of tubular means secured in said last mentioned openings and providing secondary chambers for receiving molten material from said primary chamber, and a pair of telescopically engaged refractory tubes secured in said opening formed by said extended portions with one tube being extended in advance of the other for initially receiving molten material for flow into said primary chamber.

4,068,531

MOLTEN METAL SAMPLER

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Division of Ser. No. 595,155, July 11, 1975, Pat. No. 4,002,073.
This application May 26, 1976, Ser. No. 690,054
Int. Cl.[2] G01N *1/12*
U.S. Cl. 73—425.4 R **10 Claims**



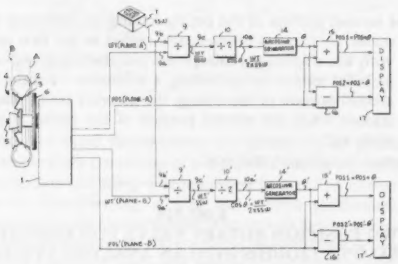
1. Structure comprising a casing, a pair of dissimilar devices disposed in said casing in a side-by-side relation for respectively receiving different forms of samples of molten metal, a support secured in said casing and provided with a pair of openings respectively receiving portions of said devices, one of said devices comprising a pair of mating sections defining a chamber, a pair of telescopically connected glass tubes for receiving molten metal for flow into said chamber, with one of said tubes extending through one of said openings, /and/ the other of said devices comprising a pair of telescopically connected glass tubes with one of these tubes extending through the other opening in said support, an elongated tubular housing surrounding said structure, and said casing being provided with means for engagement by a member insertable into said housing for facilitating release of said casing and devices as a unit from said housing.

4,068,532

ELECTRONIC WHEEL BALANCER APPARATUS AND METHOD

Bernard J. Green, Bristol, Tenn., and Jerome J. Chorosevic, Bristol, Va., assignors to Plumbium Manufacturing Corporation, Bristol, Tenn.

Filed Dec. 21, 1976, Ser. No. 753,094
Int. Cl.[2] G01M *1/08*
U.S. Cl. 73—462 **22 Claims**



1. In a system for counter-balancing wheels by using balance weights of a single, pre-selected mass, the system having means for providing a pair of electrical signals, the first signal of such pair representing the angular location on the wheel, at a pre-selected radius, at which a weight of a magnitude sensed by said means should be placed to develop a counter-balancing moment in the direction required in order to balance the wheel, and the second signal of such pair representing the magnitude of the sensed weight which, if placed at said angular location, will develop a counter-balancing moment needed to balance the wheel, the improvement comprising:

a. electronic means for receiving said pair of electrical signals;

b. electronic processing means for converting said pair of electrical signals into electrical balancing position signals representing at least two locations on said wheel at said pre-selected radius at which one each of said balance weights should be affixed to said wheel to counter-balance said wheel; and

c. means for visually displaying said locations at which the balance weights should be affixed.

4,068,533

ESG REFLECTED IMPEDANCE PICKOFF

Lincoln Stark Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Nov. 30, 1976, Ser. No. 746,041
Int. Cl.[2] G01C *19/28*
U.S. Cl. 74—5.6 D **14 Claims**

1. An electrostatic gyroscope having two input axes and a spin axis comprising:

an electrode structure,

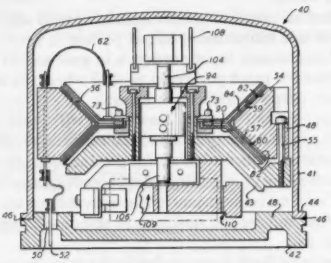
a rotor disposed about said electrode structure,

means for capturing said rotor along three orthogonal axes in displacement and about said two input axes of said orthogonal axes in rotation,

means to impart a rotation to said rotor and to sustain said

rotation at a predetermined rate said rotation being about said spin axis of said orthogonal axes,

mounting means on said electrode structure providing two degree-of-freedom rotational compliance about said two orthogonal axes about which said rotor is captured rotationally, and



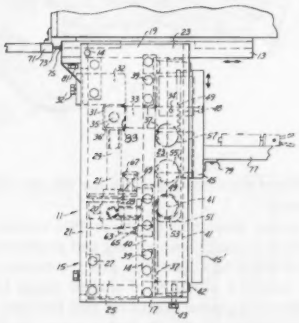
means responsive along said two orthogonal axes about which said rotor is captured rotationally coupled to said electrode structure constraining said electrode structure in place in the presence of gyroscopic reaction torques and providing output signals representative of input rate.

4,068,534

VERTICAL LIFT ASSEMBLY

Claude Descoteaux, and Chester Wenzel, both of 15555 E. 12 Mile Road, Roseville, Mich. 48066

Filed Sept. 30, 1976, Ser. No. 728,276
Int. Cl.[2] F16H *21/02*
U.S. Cl. 74—27 **9 Claims**



1. A vertical lift assembly comprising a framework including top and bottom plates, side plates and a back plate, and open at the front;

an upright air cylinder on said bottom plate bearing against and secured to said back plate; and

including a reciprocal piston rod projecting from said cylinder;

a lift arm at one end secured to the upper end of said piston rod and parallel to said bottom plate;

a pair of spaced upright guide rods extending between said top and bottom plates and secured to said framework;

a vertically reciprocal carriage mounting a pair of bearing blocks with internal bushings guidably mounted upon said guide rods, and adapted to mount a horizontally disposed workpiece gripper;

an upright movable rack gear mounted upon the interior of said carriage;

an upright stationary rack gear opposed to and spaced from said movable rack gear interposed between said top and bottom plates and secured to said framework;

a vertically reciprocal carrier having a pair of opposed upright side plates; and

a series of vertically spaced pinions journalled upon said carrier between said side plates, in meshing engagement with said stationary rack gear;

at least one pair of pinions at all times being in meshing engagement with both of said rack gears;

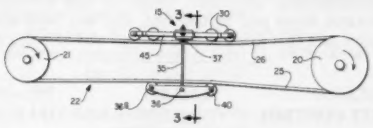
the other end of said lift arm being secured to said carrier, whereby reciprocal movements of said piston rod and lift arm effect corresponding movements of said carrier, in turn, effecting corresponding raising and lowering movements of said carriage.

4,068,535

METHOD AND APPARATUS FOR CONTROLLING THE TENSION OF DRIVE BELTS

Kerney T. Sheets, Duplessis, La., assignor to David L. Ray, Baton Rouge, La.

Filed Nov. 10, 1975, Ser. No. 630,195
Int. Cl.[2] F16H *7/12, 7/10*
U.S. Cl. 74—242.11 A **16 Claims**



1. A floating apparatus for controlling the tension of a flexible drive belt connecting a drive pulley to a driven pulley, said apparatus being supportable solely by said drive belt, said floating apparatus comprising:

a. first rotatable means for frictionally engaging the slack run of said drive belt, said first means being disposed on the outside of said drive belt,

b. second rotatable means for frictionally engaging the drive run of said drive belt, said second rotatable means being disposed on the outside of said drive belt, said second rotatable means having an axis of rotation parallel to the axis of rotation of said first rotatable means,

c. means for connecting said first rotatable means to said second rotatable means,

d. adjustable tension imposing means connected to said first rotatable means for urging said drive run of said drive belt and said slack run of said drive belt toward each other to maintain the tension in said drive belt sufficiently to prevent substantial slippage of said drive belt about said drive pulley and said driven pulley.

4,068,536

MANIPULATOR

Theodore Hahn Stackhouse, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 23, 1976, Ser. No. 753,725
Int. Cl.[2] F16H *1/14*
U.S. Cl. 74—417 **18 Claims**

18. An improved remotely operable articulated manipulator of the type having a plurality of serially connected drive shafts and an end-effector mounted to one end thereof, wherein the improvement comprises:

a. a first set of concentric drive shafts independently rotatable about a first axis coincident with one ordinant of a mutually perpendicular triordinate system;

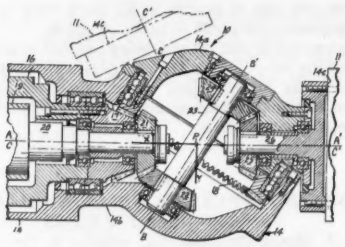
b. a second set of concentric drive shafts independently rotatable about a second axis obliquely oriented with respect to said first axis and rotatable thereabout;

c. a first set of gears, including at least two bevel gears, attached to at least two shafts in said first set of shafts;

d. a second set of gears, including at least two bevel gears,

attached to at least two shafts in said second set of shafts, said second set of gears being drivingly connected to said first set of gears; and

e. a third shaft mounted to said second set of shafts and rotatable about a third axis obliquely fixed to said second axis and rotatable thereabout, said third shaft having the



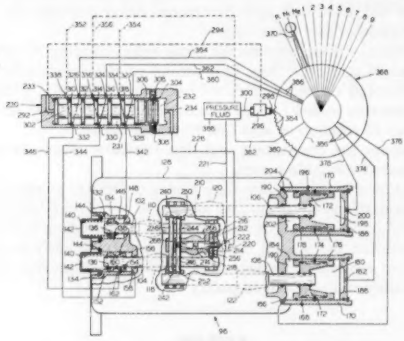
end-effector mounted thereto whereby the movement of said end-effector has a directional component of movement in each of the directions defined by said mutually perpendicular triordinate system as said end-effector is rotated about said second axis, and said third axis intersects said first axis and said second axis at a single point.

4,068,537

SHIFT CONTROL SYSTEM FOR A MULTIPLE INPUT TRANSMISSION

Robert W. Wolfe, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 12, 1976, Ser. No. 731,391
Int. Cl.² G05G 5/10
U.S. Cl. 74—477 **20 Claims**



1. A shift control system in combination with a transmission having a multiple input portion and a multiple output portion each of which in turn contains a plurality of change speed gears to provide for a plurality of drive ratios, said control system comprising:

a. a movable control member for a preselector valve having a plurality of positions, each corresponding to a separate one of said drive ratios;

b. first sensing means, associated with said preselector valve, for producing a first signal upon movement of said control member from one to another of said plurality of positions;

c. a neutral sequence valve including movable means, said movable means being maintainable in first and second alternate positions, said neutral sequence valve being fluidically interconnected, on one end, with said first sensing means for moving said movable means to one of said first and second positions in response to said first signal;

d. a plurality of fluid-pressure operated actuators, each being shiftable between at least two predetermined positions, to couple and de-couple predetermined ones of said change speed gears, with the actuators associated with said transmission input portion being fluidically interconnectable with said preselector valve via said neutral sequence valve and the actuators associated with said transmission output portion being fluidically interconnected with said preselector valve;

e. mechanical interlock means associated with said actuators to lock said transmission output portion in gear whenever said transmission input portion is in gear and to lock said transmission input portion in neutral whenever said transmission output portion is in neutral;

f. second sensing means, associated with said interlock means and fluidically interconnected with another end of said neutral sequence valve, for producing a second signal upon movement to neutral of said transmission input portion, said movable means being movable to the other of said first and second positions in response to said second signal; and

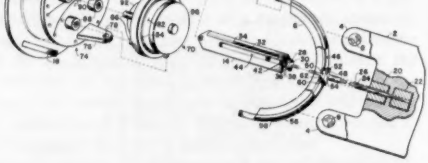
g. a source of fluid pressure fluidically interconnected with said preselector valve, first sensing means, second sensing means and movable means.

4,068,538

STABILIZED PLATFORM SYSTEM

Walker Butler, Scottsdale, and Fred Krahulec, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 12, 1975, Ser. No. 586,322
Int. Cl.² G01C 19/28, 19/30
U.S. Cl. 74—5.22 **11 Claims**



1. A stabilized platform apparatus for use on a mobile vehicle, comprising:

pedestal means mountable on the mobile vehicle;

gimbal means rotatably supporting and positioning the platform and allowing at least one axis of rotation, said gimbal means having a plurality of shaped edges for slideably mounting said gimbal means on said pedestal means said slideable mounting of said gimbal means for limiting said gimbal means to motion in an arcuate path with respect to said pedestal means; and

free gyro means gimballed to the platform for supplying a positional reference with respect to said platform in said at least one axis.

4,068,539

VARIABLE-RATIO TRANSMISSION

Wladimir Nyc, 5254 San Jose Blvd., Jacksonville, Fla. 32207

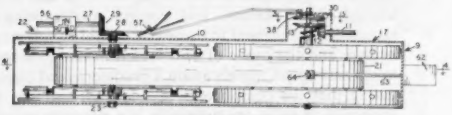
Filed Oct. 24, 1975, Ser. No. 625,632
Int. Cl.² F16H 55/54
U.S. Cl. 74—230.18 **19 Claims**

1. A transmission connecting a drive shaft to a driven shaft having variable requirements to torque and speed, said transmission comprising:

a. a frame;

b. a first drum rotatably mounted on said frame for rotation about a first axis;

c. first means for connecting said drive shaft and said first drum;
d. a first substantially circular resilient band mounted coaxially on said first drum for radial expansion and contraction;
e. a second drum rotatably mounted on said frame for rotation about a second axis;
f. second means for connecting said second drum and said driven shaft;
g. a second substantially circular resilient band mounted coaxially on said second drum for radial expansion and contraction;



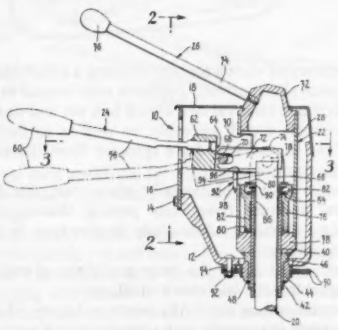
h. an endless belt connecting said first circular band and said second circular band, said belt being effective to transfer power from said drive shaft and said first drum to said second drum and said driven shaft;
i. said first means for connecting said drive shaft and said first drum including spring means connected therebetween for transferring power from said drive shaft to said first drum and yieldable in response to change in torque transmitted therethrough thereby to permit limited relative angular displacement between said drive shaft and said first drum, and
j. means responsive to such displacement to vary the diameter of said first circular band.

4,068,540

TRANSMISSION CONTROL

Joseph W. Beckerman, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Aug. 4, 1976, Ser. No. 711,344
Int. Cl.[2] G05G 5/10
U.S. Cl. 74—476 **3 Claims**



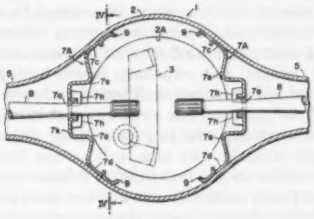
1. A transmission control for use with a transmission of the type having a first change gear mechanism for establishing a plurality of drive speeds and a second change gear mechanism for establishing either a forward or reverse drive for each of said plurality of drive speeds, said transmission control including:
first shift lever means shiftable between a plurality of positions corresponding to each of said plurality of drive speeds;
a first tube assembly interconnecting the first shift lever means with the first change gear mechanism;
second shift lever means shiftable between forward and reverse positions; and
a second tube assembly interconnecting the second shift lever means with the second change gear mechanism, the second tube assembly being coaxially disposed about the first tube assembly;
said transmission control means being further characterized by the combination therewith of
stop means mounted on the second tube assembly and contactable by the first shift lever means to prevent the transmission from operating in one or more selected reverse speeds.

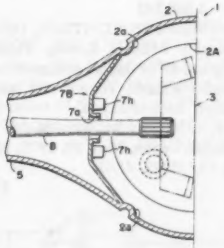
4,068,541

BANJO-SHAPED AXLE CASING

Masao Sakamoto; Ryoichi Okuda; Hitoshi Saito, and Kenzi Sasazaki, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 29, 1976, Ser. No. 709,804
Claims priority, application Japan, Dec. 11, 1975, 50-167557
Int. Cl.[2] F16H 57/02
U.S. Cl. 74—607 **6 Claims**



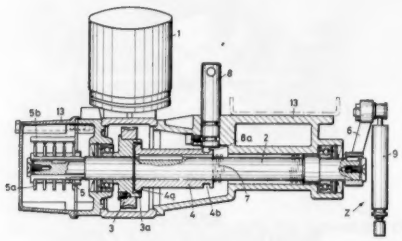


1. A banjo-shaped axle casing of the type including a differential housing and a pair of axle housings coupled to said differential housing comprising:
at least one pair of mounting members provided on the inside surface and on each side of the axle casing and opposite each other; and
at least one pair of flexible partitions inserted into the axle casing, said flexible partition being inserted into the axle casing such that they engage with the mounting members and partition the differential housing from the axle housing thereby preventing large amounts of oil from flowing into said axle housing during applications of a horizontal inertial force.

4,068,542
DRIVE ARRANGEMENT FOR TRANSPORT VEHICLES

Werner Brand, Leverkusen; Dieter Schillings, Neuss; Leo Geers, Kaarst, and Edmund Pietrowski, Dusseldorf, all of Germany, assignors to Waggonfabrik Uerdingen A.G., Duesseldorf, Germany

Filed Oct. 12, 1976, Ser. No. 731,344
Claims priority, application Germany, Oct. 14, 1975, 2545846
Int. Cl.² F16H *37/00*
U.S. Cl. 74—625 **13 Claims**

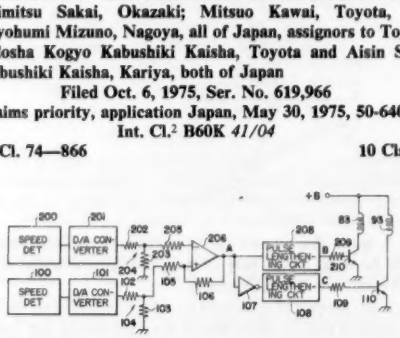


1. A drive arrangement, particularly for driving elements such as movable steps and doors on vehicles, comprising a driven element manually movable between operative positions; motorized means for moving said element, including a turnable shaft coupled to said element, and a motor coupled with said shaft for turning the latter about its axis and for moving said element between said operative positions; means for uncoupling said motor from said shaft so that said element can be manually moved; and switching means having first parts spaced from and about said shaft and second parts mounted on said shaft for joint rotation therewith and having respective angular orientations relative to said shaft, said second parts each being turnable with said shaft to and from a control position relative to said first parts, in which control positions said second parts cooperate with said first parts for controlling the operation of said motor so that manual movement of said shaft upon uncoupling of said motor therefrom enforces movement of said second parts to said control positions, whereby subsequent actuation of said motor is facilitated.

4,068,543
HYDRAULIC TRANSMISSION CONTROL DEVICE

Toshimitsu Sakai, Okazaki; Mitsuo Kawai, Toyota, and Kiyohumi Mizuno, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of Japan

Filed Oct. 6, 1975, Ser. No. 619,966
Claims priority, application Japan, May 30, 1975, 50-64095
Int. Cl.² B60K *41/04*
U.S. Cl. 74—866 **10 Claims**



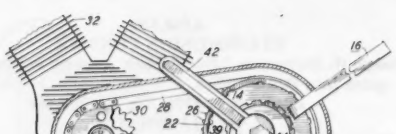
1. In a transmission system utilizing a differential gear set having a high speed transmission path and a low speed transmission path for coupling power from an input shaft to an output shaft, said gear set being operably connected to selectively controllable, variable displacement hydraulic pump-motor speed control means constructed and arranged to supply a selectively variable speed control input to said differential gear set to adjust the speed ratio thereof, the combination comprising:

a. first clutch means operable when engaged to couple said speed control means to said gear set to control the speed ratio of said high speed transmission path;
b. second clutch means operable when engaged to couple said speed control means to said gear set to control the speed ratio of said low speed transmission path;
c. means for producing speed signals representative of the rates of rotation of said output shaft and said input shaft, respectively; and
d. control means responsive to said speed signals for controlling the engagement and disengagement of said first and second clutch means, said control means being constructed and arranged to cause one of said clutch means to engage and the other of said clutch means to disengage when said speed signals attain a predetermined ratio indicating that the components of said high and low speed transmission paths are operating at a common speed; and
e. retarding means for delaying the disengagement of said disengaging clutch means so that both said first and second clutch means are temporarily engaged for a period of time immediately following the time when said speed signals attain said predetermined ratio.

4,068,544
MOTORCYCLE CLUTCH TOOL

Gregory P. Breeckner, Candlewood Shores, Brookfield, Conn. 06804

Filed Sept. 16, 1976, Ser. No. 724,030
Int. Cl.² B25B *13/48, 13/02*
U.S. Cl. 81—3 R **7 Claims**



1. A motorcycle clutch tool for securing a clutch hub assembly to a clutch shell normally rotatable with respect to said hub so as to facilitate removal of a clutch hub nut and disassembly of a motorcycle clutch assembly, as well as to facilitate removal of the motorcycle drive sprocket from the associated drive shaft, comprising:

A. a unitary rigid substantially planar thin disc having a central aperture completely passing therethrough and having a diameter substantially greater than its thickness incorporating:
   a. first means about the outer periphery of said disc engageable with said clutch shell, and
   b. second means about the inner periphery of said disc aperture engageable with said clutch hub assembly; and
B. a handle member, for attachment to the unitary disc, and when attached usefull for positioning and applying torque to said disc.

4,068,545
METHOD OF AND APPARATUS FOR FEEDING NONROUND-SECTION BARS TO SCREW MACHINES

Holger Scheler, Klausdorf, Schwentine, Germany, assignor to Hagenuk Vormals Neufeldt & Kuhnke GmbH, Kiel, Germany

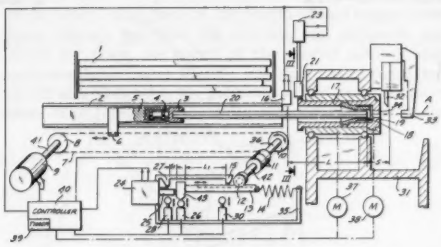
Filed July 28, 1976, Ser. No. 709,284
Claims priority, application Germany, Aug. 26, 1975, 2537852
Int. Cl.² B23B *13/02*
U.S. Cl. 82—1 C **10 Claims**

1. A method of feeding an elongated profiled bar to a screw

machine having a headstock whose collet has an openable aperture that complements the cross-sectional shape of said bar and wherein the collet is closed on said bar and driven at a relatively high rotational speed during machining, said method comprising the steps of:

holding said collet open;

detecting the rotational speed of said collet and generating a



speed output only when said rotational speed lies within a predetermined relatively low-speed range;

pushing said bar longitudinally forwardly toward said collet only in response to generation of said speed output, whereby when the open aperture and said bar align the latter can pass forwardly through the former; and

closing said collet on said bar only after passing of same forwardly through said aperture.

4,068,546

FEED APPARATUS FOR SCREW MACHINE

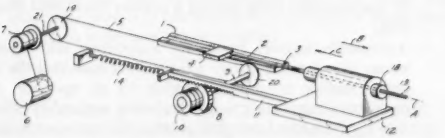
Johannes Werkmeister, Reichenbach, Germany, assignor to Hagenuk Vormals Neufeldt & Kuhnke GmbH, Kiel, Germany

Filed July 28, 1976, Ser. No. 709,283

Claims priority, application Germany, Aug. 22, 1975, 2537473

Int. Cl.[2] B23B *13/02*

U.S. Cl. 82—1 C **10 Claims**



1. A bar feed apparatus for a lathe having a headstock displaceable axially forwardly and backwardly, said apparatus comprising:

a pusher axially displaceable adjacent said headstock;

means including a chuck rotatable on said pusher for holding a bar extending axially through said headstock and for coupling said pusher to a bar held in said chuck for joint axial displacement forwardly and backwardly;

drive means couplable to said pusher for displacing same axially forwardly toward said headstock and thereby displacing a bar held in said chuck through said headstock; and

releasable means connected between said pusher and said headstock for positively linking same together for joint synchronous axial displacement thereof forwardly and backwardly.

8. In a method of operating a screw machine wherein a shaft is rotated to move a pusher rod that in turn displaces a bar forwardly along an axis through a headstock axially displaceable forwardly and backwardly, the improvement comprising the step of positively linking said headstock to said shaft and thereby coupling said headstock and said pusher rod for joint and synchronous axial movement forwardly and backwardly during machining operations.

4,068,547

TAIL STOCK

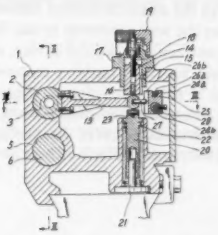
Teruyuki Ito, Nagoya, and Tadashi Yamauchi, Kariya, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed Jan. 26, 1977, Ser. No. 762,932

Claims priority, application Japan, Apr. 2, 1976, 51-39582[U]

Int. Cl.[2] B23D *23/00*

U.S. Cl. 82—31 **5 Claims**



1. A tail stock for compensating for tapering of a workpiece to be machined, comprising:

a housing;

a center sleeve slidably and rotatably mounted in said housing and provided at one end thereof with a bore with a predetermined eccentricity for holding a center;

actuating means for sliding said center sleeve;

an arm secured at one end thereof to the center sleeve;

a cylindrical member mounted in said housing being slidable in a direction perpendicular to a sliding direction of said center sleeve and abuttingly engaging one side surface of the other end of said arm;

a feed screw shaft rotatably mounted on said housing, but being restrained from axial movement relative thereto, and being threadedly engaged with said cylindrical member;

a supporting member slidably mounted in said housing in an opposite relation with said cylindrical member for supporting the other side surface of the other end of said arm in cooperation with said cylindrical member; and

resilient means for urging said supporting member in a direction to engage the other side surface of the other end of said arm.

4,068,548

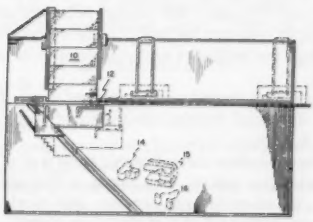
METHOD AND A TOOL FOR CUTTING MATERIALS

Cray L. Ross, 309 Jackson Road, Enfield, Conn. 06082

Division of Ser. No. 503,182, Sept. 4, 1974, abandoned, which is a continuation of Ser. No. 355,170, April 27, 1973, abandoned. This application May 4, 1976, Ser. No. 682,910

Int. Cl.[2] B26F *3/12*

U.S. Cl. 83—1 **6 Claims**



1. A method of forming cavities in a block of packing material including the steps of providing at least one heated wire tool, a portion of which heated wire tool is formed as a closed generally planar loop portion defining a figure having an out-

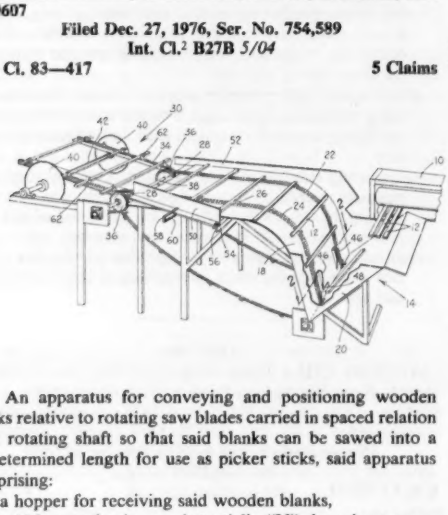
line corresponding to the section of the cavity to be formed, and a portion formed as a support for said generally planar loop portion, pressing said planar loop portion into a block of packing material in the direction generally normal to the plane of said generally planar loop portion to the depth desired for said cavity to define the side walls of a first cavity, leaving waste material therein, moving said tool in a direction generally parallel to the plane of said generally planar loop portion a distance equal to the distance desired between said plurality of cavities to sever the waste material in said first cavity and to form the bottom surface of a second cavity, and withdrawing said tool from said block of packing material in a direction generally normal to the plane of said generally planar loop portion to form the side walls of the second cavity as the heated wire simultaneously severs the waste material within said second cavity from said block of heat severable material.

4,068,549

PICKER STICK FEED AND SAWING DEVICE

James Earle Huffman, 42 Stone Haven Drive, Greenville, S.C. 29607

Filed Dec. 27, 1976, Ser. No. 754,589
Int. Cl.[2] B27B *5/04*
U.S. Cl. 83—417 **5 Claims**



1. An apparatus for conveying and positioning wooden blanks relative to rotating saw blades carried in spaced relation on a rotating shaft so that said blanks can be sawed into a predetermined length for use as picker sticks, said apparatus comprising:

a. a hopper for receiving said wooden blanks,

b. said hopper having a substantially "V" shaped cross-section with a forward wall thereof being arcuate,

c. a pair of opposed endless conveyor chains running up through the bottom of said hopper up over said forward wall,

d. aligned dogs carried on said opposed chains for engaging and lifting said wooden blanks as said dogs pass through said hopper,

e. inclined members carried on said front wall of said hopper for engaging said wooden blanks as they are raised on a pair of spaced dogs forcing improperly positioned wooden blanks off of said conveyor chains,

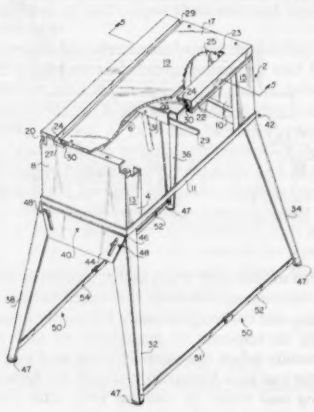
f. said inclined members extending outwardly from said front wall and terminating short of an outer surface of said dogs, said run of said conveyor chains passing under said saw blades so that opposed ends of said wooden blanks are cut off as said blanks are transported past said saw blades.

4,068,550

FOLDABLE BENCH FOR A PORTABLE HAND-HELD CIRCULAR SAW

Edward L. Gray, Rte. 7, Gray Bluff Trail, Chapel Hill, N.C. 25714, and Bruce E. Browning, Jr., P.O. Box 56, Carrboro, N.C. 25710

Filed Sept. 14, 1976, Ser. No. 723,475
Int. Cl.[2] B27B *5/18*
U.S. Cl. 83—471.2 **21 Claims**



1. A foldable bench for converting a normally hand held electrically power circular saw having a base plate into a table saw, comprising

a. housing means for supporting a normally hand held electrically powered circular saw, said housing means including an upper surface for supporting material in a position to be cut by a normally hand held, electrically powered circular saw supported by said housing means, said housing means generally defining a parallelopiped having a first and second pair of opposed side walls, said first pair of opposed side walls having a greater horizontal dimension;

b. retractable support means for supporting said housing means in a position above a floor level such that the said upper surface is easily accessible by an operator, said retractable supporting means including a plurality of foldable leg members having floor engaging extremities movable from a first position wherein said foldable leg members are contained entirely within said housing means to the second position wherein said floor engaging extremities are positioned laterally beyond the lateral extremities of said upper surface; and

c. stabilizer means for engaging the upper extremity of each leg member when in said second position in order to resist further outward lateral movement, said stabilizer means including four clips rigidly connected adjacent each of the lower lateral edges of said first opposed side walls, whereby said foldable bench may be extremely compact when said foldable leg members are in said first position and extremely stable when said foldable leg members are in said second position.

4,068,551

EXTENSION TABLE FOR POWER SAWS

Lloyd D. Kreitz, P.O. Box 60, Pequot Lakes, Minn. 56472

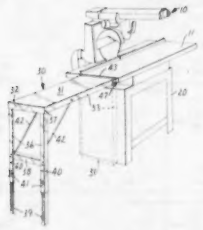
Filed Dec. 27, 1976, Ser. No. 753,990
Int. Cl.[2] B27B *5/20*
U.S. Cl. 83—471.3 **9 Claims**

1. In combination with a power saw of the type comprising a generally rectangular flat-topped horizontal worktable supported a fixed distance above a floor and a driven blade asso-

ciatively connected thereto for cutting a workpiece supported thereon,

a generally C-shaped horizontally disposed mounting bracket connected to a lateral edge of the worktable slightly below the upper surface thereof, said bracket terminating in a pair of horizontally spaced arms, each containing a hole functioning as a gudgeon,

a generally rectangular, flat-topped extension table comprising an elongate flat panel having lips depending from each of the longer sides thereof, the length of said longer sides being slightly less than the distance said gudgeons are above the floor, the length of the shorter sides of said extension table being slightly less than the distance between said gudgeons, the proximal end of said extension table being positioned between said gudgeons, a pintle



extending through said lips and said gudgeons, said extension table being rotatable about said gudgeons to assume a horizontal, laterally extending position closely approximating the lateral edge of the worktable and substantially coplanar therewith when said extension table is in use and a vertical, downwardly extending position adjacent the lateral edge of said worktable when said extension table is not in use, said extension table being readily detachable from said worktable by removing the pintle from said gudgeons,

a pair of legs, each located between said lips and hingedly connected thereto at the distal end of said extension table to permit said legs to support said distal end when the extension table is in use and to fold thereunder when said extension table is in stored position.

4,068,552

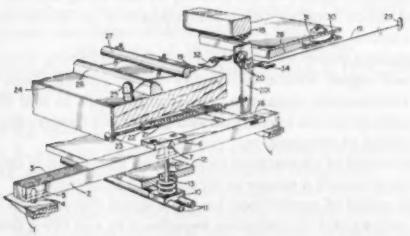
METHOD OF AND APPARATUS FOR PRODUCING MUSICAL INSTRUMENT KEYBOARD-CONTROLLED PITCH VARIATION, TONE ALTERATION AND THE LIKE

John Allen, 130 Hamilton St., Cambridge, Mass. 02138

Filed July 2, 1976, Ser. No. 702,297

Int. Cl.[2] G10H *1/02, 3/02*

U.S. Cl. 84—1.06 **9 Claims**



1. A method of introducing tone variations into the sound created by the impact of downwardly depressed longitudinally extending planar playing key mechanisms in musical instruments, that comprises, depressing the key mechanisms individually; moving each key mechanism with individual freedom of longitudinal movement backward and forward substantially in the plane of the keys; limiting such backward and forward movement within predetermined limits; and responding to said backward and forward movement of the downwardly depressed key mechanisms to introduce corresponding pitch variations, tone alternations and related effects, said pitch variations being separately and differently generated for the individual key mechanisms in accordance with the degree of backward and forward movement of the corresponding key mechanisms.

4,068,553

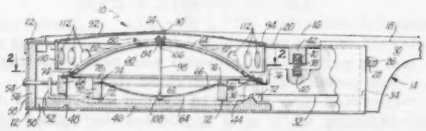
STRINGED MUSICAL INSTRUMENT

John Dopyera, 1206 S. Escondido, Escondido, Calif. 92025

Filed Apr. 7, 1976, Ser. No. 674,378

Int. Cl.[2] G10D *3/02, 1/08*

U.S. Cl. 84—296 **3 Claims**



1. A stringed, resonator type musical instrument having an instrument body, a neck mounted on and extending from said body, at least one string extending along said neck and across the top of said body, a bridge engaging and supporting said string on said body, and a resonator means located in said body generally beneath said bridge and mechanically connected to said bridge in which the improvement comprises:

a second resonator means located within said body generally parallel to said first mentioned resonator means beneath said first resonator means, and

mechanical means for transmitting vibration from said bridge to both of said resonator means,

said mechanical means including a rigid spider having a centrally located hub and a rod extending from said hub,

said bridge being mounted on said hub so as to extend therefrom, the ends of the legs of said spider remote from said hub engaging said first resonator means adjacent to the periphery of said first resonator means,

said rod extending through said first resonator means adjacent to the periphery of said first resonator means,

said rod extending through said first resonator means adjacent to the center thereof and connecting said hub with the center of said second resonator.

4,068,554

SHEET SCREW

Fumio Hirabayashi, 11-11, 3-chome, Nishimikuni,Yodogawa-Osaka, Japan

Filed Jan. 6, 1976, Ser. No. 646,884

Claims priority, application Japan, Nov. 4, 1975, 50-150991[U]

Int. Cl.[2] F16B *25/00*

U.S. Cl. 85—41 **9 Claims**

1. A sheet screw comprising:

a screw head;

a threaded shank formed of a blank by rolling and connected at its top to said screw head;

a substantially pyramidal end extending integrally from a bottom of said threaded shank to terminate in a point;

a maximum diameter of said pyramidal end being not larger than a blank diameter of said blank;

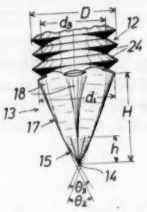
said pyramidal end having a tip portion disposed adjacent said point, and a base portion disposed between said tip portion and said bottom of said threaded shank;

said tip portion being of a substantially regular polygon in

cross section having at least five edges and at least five flat sides extending divergently from said point to said base portion;

said base portion being of a substantially regular polygon in cross section having at least three sides and at least three rounded ridges with curved outer surface;

each of said sides of said base portion being connected with a pair of adjacent rounded ridges of said base portion so as to provide a smoothly continuous contour line;



said tip portion being provided with more sides than said base portion; and

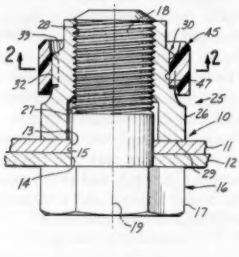
said curved outer surface of each of said rounded ridges becoming wider as it approaches the bottom of said threaded shank, thereby producing a curvature of said curved outer surface varying so as to be progressively increasing in radius toward the bottom of said threaded shank.

4,068,555

INHERENTLY TORQUE-LIMITED NUT

Josef F. Volkman, Torrance, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Sept. 2, 1976, Ser. No. 719,738
Int. Cl.[2] F16B *31/02*
U.S. Cl. 85—61 **8 Claims**



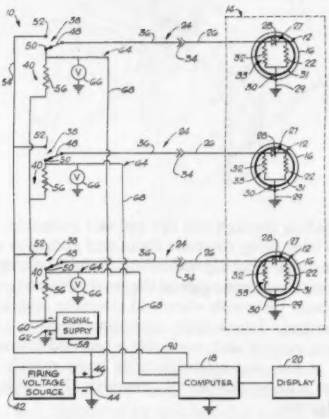
1. An inherently torque-limited nut comprising: a metal nut body having a central axis and an axially-extending internal shank-receiving opening therein; an internal thread in said opening adapted to engage a mating thread on said shank; a bearing face on said nut for bearing against adjacent structure when the nut is tightened down against the structure; engagement means formed as a peripheral array on the outside of the nut body comprising a plurality of axially extending alternating teeth and serrations, said teeth and serrations being defined by surfaces which are parallel to said central axis; a non-metallic ring surrounding said nut body; drive means on said drive ring by means of which a torque can be applied to the drive ring to turn the nut, said drive ring having a central opening having a wall; engagement means on said wall comprising surfaces in contact with the surfaces defining said teeth and serrations on the nut body, said contact being peripherally continuous and contiguous for a substantial length of both of said engagement means, whereby said drive ring and nut body are joined to one another in rotational driving relationship; the unit shear strength of the drive ring material being less than that of the nut body material, whereby upon exertion of a sufficient torque between the drive ring and the nut, the engagement means on the drive ring fails in shear at the tips of the teeth on the nut, two engagement means thereby constituting inherent limiting means limiting the torque which can be applied thereto by shear failure at a predetermined torque.

4,068,556

AMMUNITION IDENTIFICATION AND FIRING SYSTEM HAVING ELECTRICAL IDENTIFICATION MEANS

Nelson D. Foley, Little Rock, Ark., assignor to BEI Electronics, Inc., Little Rock, Ark.

Filed Feb. 3, 1977, Ser. No. 765,099
Int. Cl.[2] F41F *3/04*; F42C *19/12*
U.S. Cl. 89—1.814 **18 Claims**



1. A system for identifying and firing ammunition,

comprising a round of ammunition having an igniter with a predetermined electrical resistance and operable by an electrical firing current,

a firing circuit for said igniter and having two electrical firing circuit terminals,

a diode rectifier,

a firing current path connecting said diode rectifier and said igniter in series between said firing circuit terminals,

said diode rectifier being capable of carrying a firing current of one polarity in said firing current path,

a firing voltage source for supplying the firing current of said polarity,

a signal source for supplying a signal current of opposite polarity relative to the polarity of said firing current,

said diode rectifier being nonconductive as to the signal current,

switching means for initially connecting said firing circuit to said signal source to identify the ammunition and for subsequently connecting said firing circuit to said firing voltage source to energize said igniter and thereby fire the round of ammunition,

said round of ammunition including an identification impedance having a nature to identify said ammunition,

said round of ammunition having a signal current path connecting said identification impedance to said firing circuit,

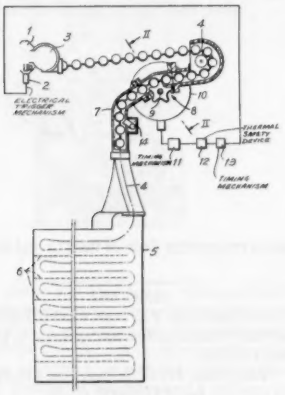
said signal current path being in parallel with at least a portion of said firing current path,

and measuring means connected to said firing circuit for measuring the impedance of said signal current path and thereby indicating the nature of said identification impedance to identify the ammunition.

4,068,557
AUTOMATIC WEAPONS HAVING A CARTRIDGE BELT FEED

Paul Rene Montjailard, 25 D rue Edmond Charpentier, 42000 St. Etienne; Joseph M. Laniel, Lotissement la Taille, 42390 Villars, and Guillaume A. Gay-Chatain, 66 rue Marengo, 42000 St. Etienne, all of France

Filed Oct. 14, 1976, Ser. No. 732,441
Claims priority, application France, Oct. 15, 1975, 75 31480
Int. Cl.[2] F41D 9/02
U.S. Cl. 89—33 E 13 Claims



1. In an automatic weapon fed by a cartridge belt and comprising a trigger and feed means for feeding the cartridge belt by applying traction force to the belt, an improvement comprising feed assisting means for applying additional traction to the belt comprising at least one star-shaped rotor in mesh with the cartridge belt in a zone situated downstream of the feed means and an electrical motor directly drivingly coupled to said rotor and coupled to said trigger to furnish a torque whose energization is controlled by the operation of the trigger such that each time the trigger is activated the motor is energized, said motor being a direct current motor having a laminated coil and planar air gap and including an output shaft directly coupled to said rotor in driving engagement, said motor being underfed in voltage and being capable of periodic stoppage during stoppage of the belt while continuing to deliver torque to said rotor without overheating the motor.

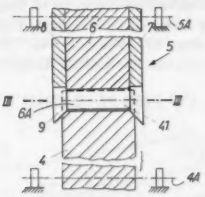
4,068,558
DEVICE FOR DEBURRING OR CHAMFERING OF THE FACE EDGES OF GEARS

Herbert Loos, Dorfen, Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Germany

Filed July 14, 1976, Ser. No. 705,269
Claims priority, application Germany, Aug. 2, 1975, 2534574; Aug. 2, 1975, 2534575
Int. Cl.[2] B23F 19/06; B26D 1/12
U.S. Cl. 90—1.6 A 11 Claims

1. In a device for deburring or chamfering the axial edges of teeth on a workpiece, the improvement comprising:

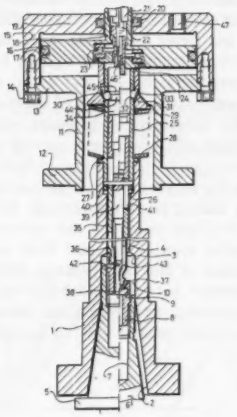
a tool having a toothed, non-cutting guide disk and at least one toothed cutting disk fixedly mounted on an axially facing side of said guide disk, the teeth on said guide disk being axially aligned with the teeth on said cutting disk, each tooth on said cutting disk having on the edges thereof adjacent said guide disk a beveled surface facing axially toward said cutting disk, said beveled surface having cutting means thereon whereby a meshing engagement of said tool with said workpiece will effect an engagement of said beveled surface and said cutting means thereon and a cutting of a beveled edge on the corresponding axially facing edge of the teeth on said workpiece.



4,068,559
TOOL FASTENING DEVICE

Herbert Schmid, Jr., Albstrasse 1, 7251 Malmsheim, Germany, and Edmo Benatti, Via del Vivaio, 46100 Frassine-Mantova, Italy

Filed July 30, 1976, Ser. No. 710,016
Int. Cl.[2] B23C 5/26
U.S. Cl. 90—11 D 4 Claims

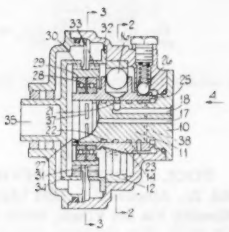


1. In a quick change device for a hollow spindle of a machine tool, in particular a milling machine arranged for the quick releasing and clamping of a conical tool holder, said tool holder having a shaft with a ring groove at the small end of the shaft, a coupling casing, said coupling casing being attached to the spindle and having a flange, a cylindrical drawbar axially shiftable within the casing, clamping spring means about the casing pressing on one hand against said flange, a tool holder drawbar connection including radially movable clamping jaws attached to said longitudinally shiftable cylindrical drawbar, an expansion rod connected to said coupling casing and being located within the drawbar for actuating the said jaws of the drawbar as the drawbar pulls the holder into the spindle under the influence of clamping springs, the clamping jaws being detachable upon compression of the clamping springs through an external means, and a releasable coupling between said drawbar and said clamping springs comprising a plurality of bores in said coupling casing and a group of radially movable balls retained in said bores, the drawbar rod being provided with a groove, a ring with a hollow cone shaped surface surrounding the drawbar, said spring means acting on the other hand against the ring, the balls being radially pressed to the inside of the drawbar groove by said ring on which the clamping springs are acting.

4,068,560
FLUID-POWERED STEPPING MOTOR

George Orloff, Solihull; Peter Ian Munnoch, Hall Green, and Alan Thomas, Stratford-on-Avon, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 17, 1976, Ser. No. 715,090
Claims priority, application United Kingdom, Aug. 30, 1975, 35848/75
Int. Cl.[2] F15B *21/02;* F01B *1/06*
U.S. Cl. 91—36 11 Claims



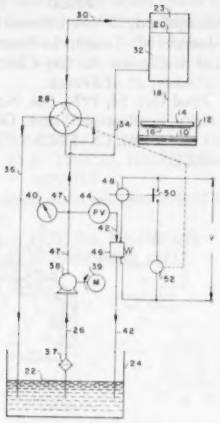
1. A fluid-powered stepping motor comprising a body, a cam track, a cylinder member mounted on said body for rotation relative to said cam track, said cylinder member having at least three radial bores therein, piston elements slidable in the respective bores and being engagable with said cam truck, means, responsive to input control signals, for sequentially applying fluid pressure pulses to said bores, said cam track including a surface having a plurality of zones whose distance from said cylinder progressively decreases substantially symmetrically on either side of a centre part of each zone, and means, operable in synchronism with said fluid pressure pulse applying means, for supplying pulses of lubricating fluid between relatively sliding faces of said body and said cylinder member only when said body and said cylinder member are urged into relative rotation by said fluid pressure pulses, whereby a sequence of said fluid pressure pulses causes stepwise relative rotation between said body and said cylinder member and in the intervals between said pressure pulses frictional resistance to said relative rotation is increased.

4,068,561
PRE-DETERMINED PRESSURE SYSTEM

Robert C. Fay, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 22, 1976, Ser. No. 651,351
Int. Cl.[2] F15B *13/042, 13/044*
U.S. Cl. 91—433 1 Claim

1. A system to apply pressure to an article to be worked on comprising: a piston chamber having a piston head slidably mounted therein, a source of fluid, an electrically operated reversing valve means, a first means to supply fluid from said source through said valve means to one side of said piston head, a second means to return fluid from the other side of said piston head to said source, a third means to return fluid from said first means to said source, a fourth means operably associated with said third means to allow fluid from said first means to flow through said third means only when the pressure of the fluid in said first means is at a pre-determined level and an electrical control circuit including a time delay means operably associated with said valve means and having flow switch means for energizing said time delay means responsive to the flow of fluid in said third means past said fourth means as it returns to said source to allow fluid to flow in said first means for a pre-determined time and then reverse the position of said

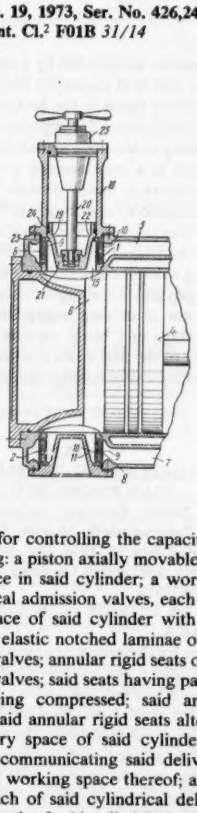


valve means to reverse the flow of fluid to and from said piston head.

4,068,562
CYLINDER OF PISTON COMPRESSOR

Mark Isaakovich Frenkel, ulitsa Karbysheva, 6, korpus 2, kv. 20, Leningrad, U.S.S.R.

Filed Dec. 19, 1973, Ser. No. 426,242
Int. Cl.[2] F01B *31/14*
U.S. Cl. 92—60.5 6 Claims



1. An arrangement for controlling the capacity of a piston compressor comprising: a piston axially movable in said cylinder; an admission space in said cylinder; a working space in said cylinder, cylindrical admission valves, each communicating said admission space of said cylinder with the working space thereof; annular elastic notched laminae of each of said cylindrical admission valves; annular rigid seats of each of said cylindrical admission valves; said seats having passages for the flow of the fluid being compressed; said annular elastic notched laminae and said annular rigid seats alternating with one another; a delivery space of said cylinder; cylindrical delivery valves, each communicating said delivery space of said cylinder with said working space thereof; annular elastic notched laminae of each of said cylindrical delivery valves; annular rigid seats of each of said cylindrical delivery valves; said seats having passages for the flow of the compressed fluid, said annular elastic notched laminae and said annular rigid

seats alternating with one another; a volume reducing cone adjacent to said admission valves and said delivery valves for reducing dead space in said valves; and means cooperating with one of said cones for adjusting the output of said cylinder.

4,068,563

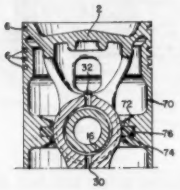
INTERNAL OIL SEAL FOR PISTON

Fred W. Ryan, P.O. Box 845, Seahurst, Wash. 98062, and Robert J. Webber, 23633 101st W., Edmonds, Wash. 98020

Division of Ser. No. 502,356, Sept. 3, 1974, Pat. No. 3,992,980, which is a continuation of Ser. No. 257,871, May 5, 1972, abandoned. This application Sept. 27, 1976, Ser. No. 726,828

Int. Cl.[2] F01B *31/10*; F16J *1/04*

U.S. Cl. 92—157 **1 Claim**



1. In a hollow piston and connecting rod assembly for use in an internal combustion engine wherein the piston includes a head, a cylindrical skirt extending from the head and a pair of diametrically opposed, transverse bores extending through the skirt of the piston, wherein a connecting rod has a passageway therethrough for passage of lubricant and a bulbous portion at one end through which a bore extends, wherein a wrist pin extends through the bore of the connecting rod and is supported in the diametrically opposed bores of the piston, wherein inner bushing means are inserted in the bore of the connecting rod around the wrist pin, providing bearing surfaces between the inner surfaces of the bushing means and the wrist pin, wherein outer bushings are inserted in the bore extending through the skirt of the piston and around the wrist pin to provide bearing surfaces between inner surfaces of the outer bushings and the wrist pin, the outer bushings spaced from terminating ends of the inner bushing means to provide lubricant passages so that lubricant forced under pressure through the passageway in the connecting rod lubricates the wrist pin and cools the piston head, the improvement comprising:

sealing means, including inwardly projecting lips extending from the interior surface of the skirt and integral therewith disposed opposite the axis of the wrist pin and on each side thereof, a groove formed in the portion of each of the lips facing the wrist pin, and a wiping seal received in each of the grooves contacting the exterior surface of the bulbous portion of the connecting rod, the inwardly projected lips and wiping seals closing the entire area between the bulbous portion of the connecting rod and the interior surface of the skirt of the piston so that the lubricant forced through the passageway in the connecting rod beneath the piston head and above the connecting rod builds up pressure therein, the lubricant forced to return below the sealing means substantially only along the bearing surfaces between the inner and outer bushings and wrist pin to provide continuous lubrication thereto.

4,068,564

MACHINE FOR ROLLING NEWSPAPER INTO LOGS

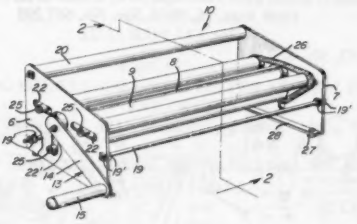
Reuben O. Dahlstrom, 435 Second Ave. NW., Milaca, Minn. 56353

Filed June 11, 1976, Ser. No. 695,160

Int. Cl.[2] B31C *1/00*

U.S. Cl. 93—1 C **9 Claims**

1. A paper roller having spaced relatively braced end supports, a winding roller removably journaled between the end supports, a plurality of spring urged floating rollers journaled between the end supports and opposing the winding roller from remote sides to apply continual pressure thereto, rotary torque input means drivingly connected to the winding roller, said end supports defining elongated guides disposed on remote sides of said winding roller and extending generally radially of the axis of rotation of the latter, bearings mounted in



said guides for shifting therealong, the opposite ends of said floating rollers being journaled from said bearings, said bearings at each end support including aligned recessed portions facing outwardly from said winding roller, and an endless spring member trained about each set of corresponding recessed portions yieldingly biasing said bearings, and thus said floating rollers, inwardly along said guides toward said winding roller.

4,068,565

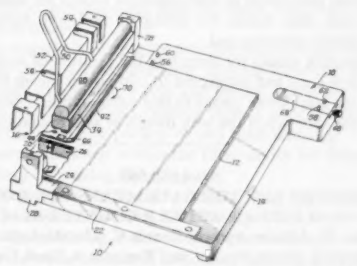
METHOD AND APPARATUS FOR MAKING BUSINESS FORM DUMMY

Samuel R. Olsen, 207 Data Drive, Streamwood, Ill. 60103, and Robert Lapp, 5733 Grant, Hinsdale, Ill. 60521

Filed Aug. 19, 1976, Ser. No. 715,685

Int. Cl.[2] B31F *5/02*

U.S. Cl. 93—1.1 **17 Claims**



1. A method for forming a test dummy of business forms for imprinting by a business machine having a plurality of spaced apart traction pins for moving said forms through said machine comprising the steps of:

collating a selected variable number of paper business forms including interleaved carbon papers of variable thickness to create a stack having one common longitudinal edge;

moving said edge a predetermined distance past a plurality of perforating dies each spaced by a distance corresponding to the spacing between each pair of traction pins and a respective aligned perforating punch with said dies and punches longitudinally aligned parallel to said edge and past a plurality of crimping dies each having an aligned respective crimping punch to position said stack between all of said punches and dies; and

simultaneously and manually operating all of said punches relative to all of said dies while said stack is stationary for both piercing and crimping said stack at a plurality of spaced positions adjacent said one edge of said stack to

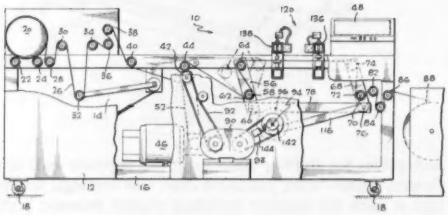
form a series of first perforations spaced apart by a distance corresponding to the distance between said spaced apart traction pins and spaced from said one edge by said predetermined distance.

4,068,566

UNIVERSAL BAG-MAKING MACHINE

Richard L. Joice, 8955 Fullbright Ave., Chatsworth, Calif. 91311

Filed Mar. 15, 1976, Ser. No. 667,205
Int. Cl.[2] F15B *15/22*
U.S. Cl. 93—8 R **21 Claims**



1. A bag-making machine comprising:

means for advancing a web of tubular synthetic polymer composition material from a source at a substantially constant rate;

first and second web control arms, each of said control arms being pivoted on its own separate pivot axis and spaced from each other in parallel with each other so as to pivot in the same direction with respect to the advancing web, each of said control arms carrying guide rollers thereon for guiding the web and for engaging the web for acting on the advancing web to cause the web to dwell at an operation station positioned between said first and second web control arms so that operation can be performed on the web at the operation station;

means positioned at said operation station for acting on said web, said means for acting on said web having power means thereon; and

detecting means for detecting the position of said web control arms and connected to said power means for energizing said power means so that an operation is performed on the web when the web dwells at said operation station.

4,068,567

COMBINED EJECTOR-GATE MEANS FOR ROTATABLE TABLE OF AN ARTICLE COUNTER-STACKER

Arthur F. Allison, Aurora; Dennis C. Christopherson, Denver; Byron L. Mays, Boulder, and Reginald A. Reed, Golden, all of Colo., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jan. 31, 1977, Ser. No. 764,081
Int. Cl.[2] B31B *1/98*; B65G *57/09*
U.S. Cl. 93—93 C **13 Claims**

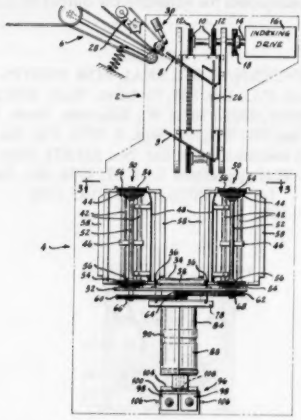
1. In an apparatus for conveying, counting and stacking articles having an input conveyor for delivering articles in a lapped stream, counting means for counting articles passing a point in said input conveyor, stacking means at the output end of said conveyor for stacking said articles one upon another and a table for receiving said stack of articles from said stacking means, the combination comprising:

vertical guide means mounted on said table for engaging opposite edges of said articles in said stack;

ejector means mounted on said table and positioned for engagement with the ends of said articles in said stack at at least one unguided end of said stack;

means operable to drive said ejector means across said table to eject said stack of articles therefrom; and

means operable to rotate said table, said guide means and said ejector means through one-half revolution and to restrain said ejector means against movement relative to said table during rotation thereof, whereby said guide



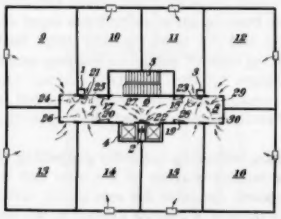
means and said ejector means cooperate to provide vertical support to said stack during table rotation.

4,068,568

FIRE SAFETY SYSTEMS

Cyril Herbert Moss, Heath Common, Storrington, Sussex, England

Filed Mar. 29, 1976, Ser. No. 671,098
Claims priority, application United Kingdom, Apr. 2, 1975, 13423/75
Int. Cl.[2] F24F *13/00*
U.S. Cl. 98—33 R **14 Claims**



1. A fire safety system for use in a building having a plurality of accommodation units and at least one communal unit providing means of access to said accommodation units, said system including at least one smoke detector in said communal unit and means for maintaining the pressure in said accommodation units above that in the communal unit when no smoke is detected by said smoke detector and for maintaining the pressure in said communal unit above that in the accommodation units when smoke is detected by said smoke detector.

4,068,569

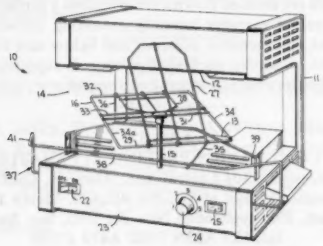
ROTARY TOASTER DEVICE

George B. Munsey, Box 4285 Asher Ave., Little Rock, Ark. 72204

Filed Feb. 4, 1977, Ser. No. 765,704
Int. Cl.[2] A47J *37/08*
U.S. Cl. 99—327 **8 Claims**

1. A toaster device comprising, a casing having spaced horizontal walls and an opening at the front thereof, a rotatable shaft extending vertically in said casing, a horizontal support

grid mounted on said shaft between said walls, means for rotating said shaft and said support grid about the central axis of said shaft, heating elements disposed horizontally on opposite sides of said support grid, at least one grid element for supporting a toastable item, said element resting on said support grid and being pivotally connected thereto for movement between a horizontal position and a raised position, means extending outwardly of said grid element for moving same to



said raised position, and said casing including abutment means disposed for contact by said outwardly extending means throughout one segment of rotation of said support grid, said abutment means being located at said front opening, whereby upon support grid rotation about said axis said grid element is caused to be moved from said horizontal position to said raised position for delivering the toastable item outwardly of said casing through said front opening.

4,068,570

APPARATUS FOR PRODUCING PIECES OF EGGS

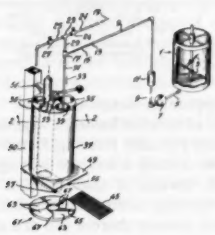
Paul Emile Lanoie, 146, rue Principale, Upton, Quebec, Canada

Filed Mar. 10, 1976, Ser. No. 665,563

Claims priority, application United Kingdom, Mar. 18, 1975, 11265/75

Int. Cl.[2] A47J *27/04*

U.S. Cl. 99—353 **6 Claims**



1. An apparatus for producing pieces of eggs which comprises:

a. a mixer for producing a blend of eggs;

b. a source of steam under pressure;

c. first duct means connected to said mixer, said first duct means comprising a tube having a constriction which prevents formation of voids in the flow of egg blend;

d. second duct means connected to said source of steam;

e. means enabling said first and second duct means to be joined whereby said blend of eggs and said steam are contacted to produce a burst of the eggs and to initiate a preliminary cooking thereof;

f. third duct means connected to said means defined in (e) to discharge the preliminary cooked eggs;

g. a container to receive the discharged eggs and to hold the same until completely cooked, said container comprising an elongated cylinder formed with a plurality of concentrically arranged cylindrical axial compartments;

h. means to cause said discharge of preliminary cooked eggs to be made alternately in said compartments;

i. means to rotate said cylinder to a next compartment when one compartment has been filled with said preliminary cooked eggs; and

j. means enabling disintegration of said cooked eggs into small pieces.

4,068,571

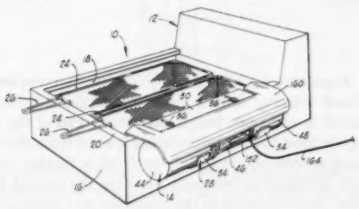
COOKING OIL CLEANER AND FILTER SYSTEM FOR DEEP FAT FRYERS

Cecil R. Cunningham, 1912 Mockingbird Lane, Altus, Okla. 73521

Filed May 3, 1976, Ser. No. 682,395

Int. Cl.[2] A47J *37/12*

U.S. Cl. 99—408 **21 Claims**



1. A deep fat fryer assembly comprising in combination:

a deep fat fryer well for containing cooking oil and having a rim extending around at least a portion of the well;

a substantially cylindrically shaped cooking oil filtration assembly having a longitudinal axis, said filtration assembly including:

a filter housing having a longitudinal substantially cylindrical outer surface and having a filter cavity formed therein communicating with an open transverse end portion thereof;

a pump housing having a longitudinal substantially cylindrical outer surface coaxially aligned with said filter housing and having a first and second transverse end portions, the first end portion thereof communicating with the open end portion of said filter housing;

filter means disposed within the filter cavity for filtering cooking oil passing therethrough;

pump means disposed in said pump housing and having a first port communicating with the open end portion of said filter housing and a second port communicating with the outer surface of said pump housing for pumping cooking oil through said pump housing; and

a motor mounted on the second end portion of said pump housing and having an output shaft drivingly connected to said pump means;

bracket means for supporting said cooking oil filtration assembly adjacent the rim of said deep fat fryer well;

first conduit means communicating with the filter cavity for conveying cooking oil between said deep fat fryer well and the filter cavity;

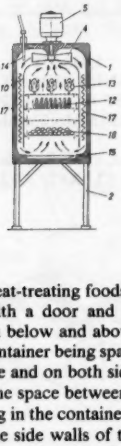
second conduit means communicating with the second port of said pump means for conveying cooking oil between said pump means and said deep fat fryer well; and

a shield supported by said bracket means and positioned above said cooking oil filtration assembly and over at least a portion of said first and second conduit means at the location where said first and second conduit means extend between said deep fat fryer well and said filter cavity and pump means, respectively, whereby said cooking oil filtration assembly is shielded from contact by a person adjacent the deep fat fryer.

4,068,572
APPARATUS FOR HEATING FOOD

Hans Vogt, 8391 Erlau, Passau, Germany

Division of Ser. No. 222,406, Jan. 31, 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,608
Int. Cl.[2] A21B 1/24
U.S. Cl. 99—447 39 Claims

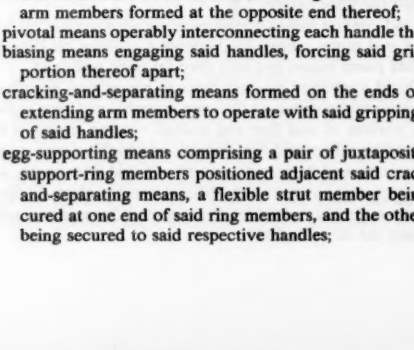


1. Apparatus for heat-treating foodstuffs, comprising a heat-insulated housing with a door and a sheet metal container mounted in and open below and above and at the side which faces the door, the container being spaced from the walls of the housing at least above and on both sides, further comprising a blower arranged in the space between the roof of the housing and the upper opening in the container and heating elements in the space between the side walls of the housing and the container and a temperature controller for maintaining the pre-set treatment temperature characterised in that, at least one gas-permeable drum is mounted in the container for rotation about a horizontal axis to receive the goods to be treated, the drum being connected to driving means.

4,068,573
UTENSIL FOR CRACKING EGGS

Angel L. Romero, 2700 Southern Ave., No. B, South Gate, Calif. 90280

Filed June 7, 1976, Ser. No. 693,739
Int. Cl.[2] A23N 5/00; A47J 43/00, 13/00; B26B 17/00
U.S. Cl. 99—578 3 Claims



1. A utensil for cracking and separating egg shells, to allow the yoke therein to be extracted therefrom, said utensil comprising:

a tongue having a pair of handles including a gripping portion formed at one end thereof, and longitudinal extending arm members formed at the opposite end thereof;

pivotal means operably interconnecting each handle thereof;

biasing means engaging said handles, forcing said gripping portion thereof apart;

cracking-and-separating means formed on the ends of said extending arm members to operate with said gripping ends of said handles;

egg-supporting means comprising a pair of juxtapositioned support-ring members positioned adjacent said cracking-and-separating means, a flexible strut member being secured at one end of said ring members, and the other end being secured to said respective handles;

said cracking-and-separating means comprising:

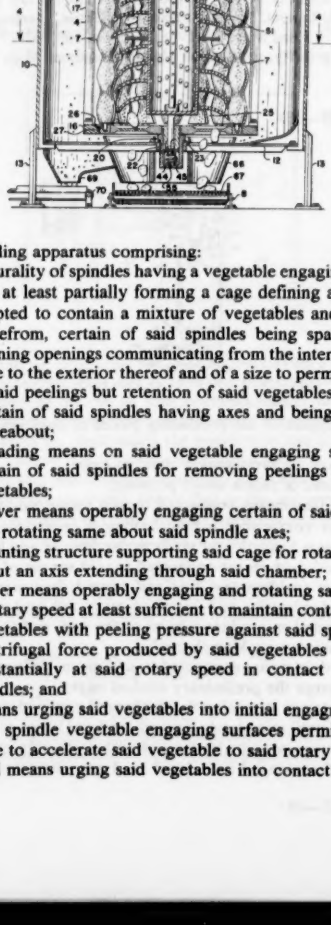
a pair of upwardly extended blade members integrally formed on each of said arm members, and centrally positioned between and below said support-ring members, wherein each blade member includes a wedged-shaped cutting edge having a substantially "V"-shaped configuration, so as to directly engage the shell of an egg disposed between said ring member, thus cracking said shell into two sections as the extending arm members are stroked downwardly against a surface area; and

a shoulder member laterally extending outwardly from said arm member, adjacent and below said blade members, whereby each shell section is supported on said shoulders during separation thereof.

4,068,574
CONTINUOUS PEELING APPARATUS

John H. Amstad, 2101 Central Ave., Alameda, Calif. 94501

Continuation-in-part of Ser. No. 452,420, March 18, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,606
Int. Cl.[2] A23N 7/00; A47J 17/00
U.S. Cl. 99—587 11 Claims



1. Peeling apparatus comprising:

a. a plurality of spindles having a vegetable engaging surface and at least partially forming a cage defining a chamber adapted to contain a mixture of vegetables and peelings therefrom, certain of said spindles being spaced apart defining openings communicating from the interior of said cage to the exterior thereof and of a size to permit passage of said peelings but retention of said vegetables;

b. certain of said spindles having axes and being rotatable thereabout;

c. abrading means on said vegetable engaging surface of certain of said spindles for removing peelings from said vegetables;

d. power means operably engaging certain of said spindles and rotating same about said spindle axes;

e. mounting structure supporting said cage for rotary motion about an axis extending through said chamber;

f. power means operably engaging and rotating said cage at a rotary speed at least sufficient to maintain contact of said vegetables with peeling pressure against said spindles by centrifugal force produced by said vegetables travelling substantially at said rotary speed in contact with said spindles; and

g. means urging said vegetables into initial engagment with said spindle vegetable engaging surfaces permitting said cage to accelerate said vegetable to said rotary speed;

h. said means urging said vegetables into contact with said

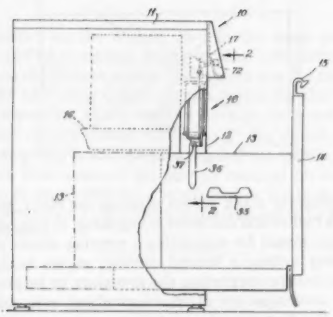
spindle vegetable engaging surfaces including a member positioned in said cage and having elongate flexible fingers and projecting generally toward said spindles a distance sufficient to contact said vegetables while said vegetables maintain contact with said spindles by centrifugal force induced by the rotation of said cage and power means operably engaging said member and rotating same, whereby peelings produced from said vegetables during said cage rotation are discharged by said centrifugal force through said openings between said spindles to said exterior of said cage.

4,068,575

REFUSE COMPACTOR WITH SELECTIVE SPRAY DEVICE

Charles R. Difley, Danville; Milton J. Johnson, Stanford, and William R. McDonald, Danville, all of Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 24, 1976, Ser. No. 717,368
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—45 **14 Claims**



1. In a refuse compactor having a receptacle for holding refuse, and means for movably carrying the receptacle for selective disposition in a refuse compacting position and in an exposed refuse receiving position, improved refuse treating means comprising: means for removably mounting above the receptacle a container of refuse treating material having a discharge valve and valve actuating means for selectively opening the valve to deliver refuse treating material from the container onto refuse in the receptacle; means for fixedly supporting the valve actuating means; and means for selectively moving the container relative to the fixedly supported valve actuating means to open the valve, said means for moving the container comprising means responsive to movement of said receptacle.

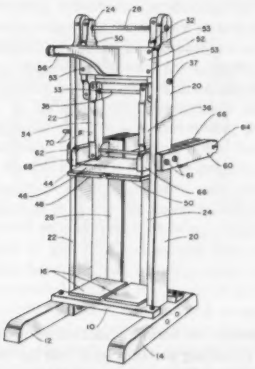
4,068,576

HAND-OPERATED PRESS FOR BALING NEWSPAPERS

Richard K. Smith, 12096 Ventura Avenue, Ojai, Calif. 93023

Filed Dec. 14, 1976, Ser. No. 750,538
Int. Cl.[2] B30B *1/12*
U.S. Cl. 100—219 **7 Claims**

1. A manually-operated press for compressing a stack of folded newspapers, and the like, comprising: a base forming the bottom of a compression box; a frame mounted on the base and forming the sides and back of the compression box and defining an open front for the compression box, said frame including a pair of spaced and parallel elongated upright members and a first pair of spaced and parallel generally horizontal elongated members extending outwardly from intermediate positions on respective ones of the upright members; a first pair of spaced and parallel linkage arms; means for pivotally mounting the linkage arms of the first pair to the top of the frame; a second pair of spaced and parallel linkage arms pivotally mounted to the lower ends of the respective arms of the first pair; a top for the compression box pivotally mounted to the lower ends of the second pair; a second pair of elongated parallel members attached to said top and extending outwardly therefrom in generally co-planar relationship therewith; means pivotally coupling the distal ends of said generally horizontal



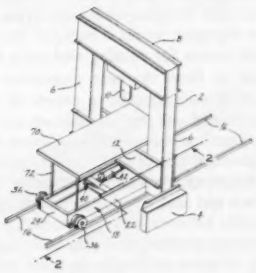
elongated members of said first pair and the distal ends of said elongated members of said second pair; and a lever-like handle affixed to one of the pairs of parallel linkage arms and extending outwardly from the plane thereof for turning the parallel linkage arms between an inclined position and an essentially vertical position so as to move said top up and down in said compression box.

4,068,577

WORK POSITIONING TABLE

Patrick Joseph Murphy, 1324 S. Plaza, Springfield, Mo. 65804

Filed Mar. 15, 1976, Ser. No. 667,080
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—224 **10 Claims**



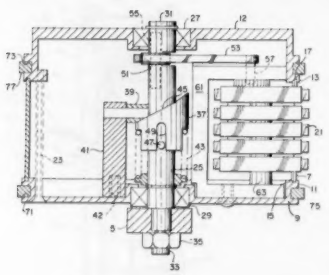
1. A table comprising: a carriage frame; a table top supported by the carriage frame; a pair of parallel axle shafts mounted on the carriage frame and having eccentric spindles at their ends; wheels mounted on the spindles and rotatable relative thereto; and means for rotating the axle shafts in unison so as to lower the wheels relative to the carriage frame and thereby elevate the carriage frame and table top, the means for rotating the axle shafts including chains wrapped around the axle shafts and means remote from the shafts for exerting a force on the chains.

4,068,578

SEQUENCE NUMBERING CODE MARKING DEVICE

Patrick Delligatti, c/o Dalemark Industries Inc., 950 Airport Road, Lakewood, N.J. 08701

Filed Aug. 6, 1976, Ser. No. 712,217
Int. Cl.[2] B41F *17/26*
U.S. Cl. 101—35 7 Claims



1. Apparatus for forming successive code marks on successive mark receiving surfaces such that the marks are positioned a predetermined distance from the leading edge of each successive mark receiving surface as the mark receiving surfaces move along a predetermined path in spaced apart relationship, said apparatus comprising

a. a support spindle;

b. a housing rotatably supported on said support spindle adjacent the predetermined path;

c. surface engaging means mounted on said housing for successively engaging each mark receiving surface as the surface moves along the path and for rotating said housing when in engagement with each mark receiving surface;

d. biasing means for continuously angularly biasing said rotatable housing toward a null position having a predetermined angular relationship with said support spindle to cause return of said housing to said null position between disengagement of said surface engaging means with one mark receiving surface and engagement of said surface engaging means with the next succeeding mark receiving surface;

e. advanceable code forming means mounted to rotate with said housing and positioned to form a successive code mark on each successive mark receiving surface when said surface engaging means is engaged therewith;

f. advance means for causing said code forming means to advance to form the next successive code mark upon rotation of said housing in excess of 180° beyond said predetermined null position, said advance means including

1. a cam surface eccentrically mounted with respect to the longitudinal axis of said support spindle,

2. an actuating lever means extending between said cam surface and said advanceable code forming means and movable between a fully retracted position and a fully advanced position, said cam being positioned eccentrically to move said actuating lever means into said fully retracted position when said housing is in the null position and to move said lever means to said fully advanced position when said housing is rotated to a position 180° from said null position, and

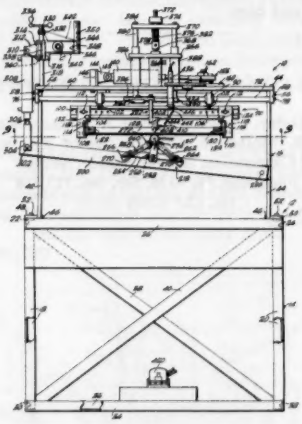
3. ratchet means for preventing said actuating lever from initiating advance of said advanceable code forming means when said activating lever means moves from its fully retracted position to its fully advanced position and for initiating and completing one advance of said advanceable code forming means each time said actuating lever means moves back from said fully advanced position to said fully retracted position.

4,068,579

CYLINDRICAL CONTAINER SILK SCREEN PRINTER WITH COORDINATED SCREEN HEIGHT AND STROKE ADJUSTMENT INDEXING MECHANISM

Ramon E. Poo, and Faustino Poo, both of Miami, Fla., assignors to Ventura International, Inc., Hialeah, Fla.

Filed Feb. 2, 1976, Ser. No. 654,551
Int. Cl.[2] B41F *17/32*
U.S. Cl. 101—38 R 21 Claims



1. A device for a silk screen printing the outer peripheral surface of a cylindrical container comprising, in combination, a first carriage means for supporting a printing screen prepared with printing indicia; a second carriage means beneath said printing screen for supporting the container to be printed for rotational movement about its longitudinal axis, means for measuring the diameter of a container, means connecting said diameter measuring means with a first drive means to sequentially move said second carriage means, with said container, into and out of a position whereat the cylindrical surface of said container is in abutting contact with the bottom surface of said screen, a second drive means to reciprocatively drive said first carriage means to effect a printing stroke in a first direction and a return stroke in the opposite direction, means to force ink deposited on the top surface of said printing screen through said silk screen, a third drive means to move said ink forcing means into engagement with the top surface of said screen on said printing stroke to effect printing of said indicia on the cylindrical container surface and to raise said ink forcing means from said top surface on said return stroke, and means for adjusting said printing and return strokes of said first carriage means so as to be correlated with the diameter of the container being printed and the movements of said second carriage means.

4,068,580

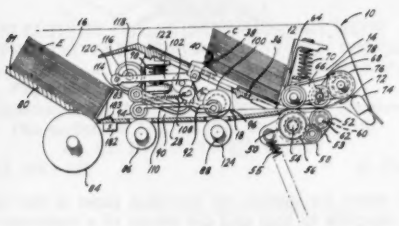
SELECTIVE DUPLICATING MACHINE

Henri Othmar Selhofer, Geneva, Switzerland, assignor to Scriptomatic, Inc., Philadelphia, Pa.

Filed Aug. 24, 1976, Ser. No. 717,085
Int. Cl.[2] B41L *47/46*
U.S. Cl. 101—53 28 Claims

1. A duplicating machine for selectively duplicating printed material from a master card containing information characteristics on one face thereof to a workpiece, said machine comprising a master card feed station including a tray for supporting a stack of master cards and card feed means for feeding a master card from the stack, a workpiece feed station including workpiece feed means for feeding a workpiece therefrom, a print station at which the printed material on a master card is duplicated on a workpiece when said print station receives

both a master card and a workpiece, moistening means for applying solvent to said workpiece between said workpiece feed station and said print station, said card feed means and said moistening means being operatively connected to a common drive member whereby said common drive member simultaneously operates said card feed means and moves said moistening means from an inoperative position where it can apply solvent to a workpiece, card reading means including a plurality of sensors operative to provide signals in a circuit and being located in the bottom of said tray whereby the information



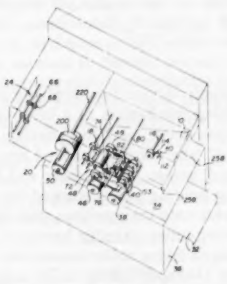
characteristics on the bottom card in the stack overlie said sensors, said card reading means reading information characteristics on the bottom master card before it is fed to said print station for providing output signals indicating that predetermined information characteristics have or have not been detected, and control means responsive to the signals from said card reading means for operating said drive member and said workpiece feed means if the printed material on said master card is to be duplicated on a workpiece or for operating only said drive member if the printed material is not to be duplicated on a workpiece.

4,068,581

ADDRESSING MACHINE

George E. Shepherd, 51 Pasteur, Dollard des Ormeaux, Quebec, Canada

Filed Mar. 14, 1977, Ser. No. 777,392
Claims priority, application Canada, Mar. 8, 1977, 273442
Int. Cl.[2] B41L *47/46*
U.S. Cl. 101—53 **11 Claims**



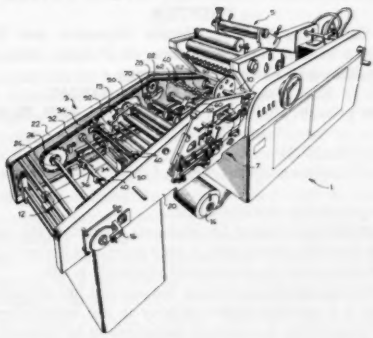
1. A hectographic apparatus for printing information on envelopes and similar workpieces from master cards each of which having an information bearing area, comprising a master card holder for receiving a stack of master cards, master card dispensing means for automatically feeding said master cards, card guiding means for translating dispensed master cards from said holder to a printing station and from said printing station to a master card discharge station, a first feed roll defining a workpiece receiving station, workpiece guiding means for translating workpiece from said workpiece receiving station to said printing station and from said printing station to a workpiece discharge station, drive means for rotating said first feed roll throughout every printing cycle, moistening means defining a moistening station upstream of said printing station for applying solvent only over the area of said workpiece to be printed, common actuating means for operating said master card dispensing means and for operating said moistening means in synchronism to insure that in every printing cycle the area of the workpiece being translated over which solvent is applied is in registry with the information bearing area of the master card being translated, sensing means for producing an electrical signal when the leading edge of a workpiece at said workpiece receiving station reaches a predetermined point in said apparatus, and registration adjustment means for adjusting the distance between the leading edge of a workpiece and the area of said workpiece to be printed, said registration adjustment means including a manual control for determining the angular displacement of said first feed roll taking place between the occurence of said electrical signal and the beginning of the operation of said common actuating means, said printing station comprising a second feed roll driven by said drive means, the axes of said first and second feed rolls being parallel to each other the linear speed of said first and second feed rolls being equal and in the same direction, said printing station also comprising a narrow segmented printing roll made of soft material and having a non-circular portion, and secured to an auxiliary shaft which is parallel to and spaced apart from the axis of said second feed roll, said auxiliary shaft being normally freely rotatable, the distance between the axis of said auxiliary shaft and that of said second feed roll being fixed and sufficient to leave a gap between the non-circular portion of said printing roll and the periphery of said second feed roll, but said distance being sufficiently short to ensure substantial flattening of said printing roll by said second feed roll when their circular surfaces meet; said apparatus also comprising a printing roll driver for causing engagement of said second feed roll and printing roll by rotating said printing roll a fixed period of time after receiving said electrical signal, and printing roll stop means for setting the starting angular position of said printing roll each time the periphery thereof looses contact with said second feed roll thus maintaining said gap until the next operation of said printing roll driver.

4,068,582

AUTOMATICALLY CONTROLLED NUMBERING MACHINE

André Poitras, Laval, and Christian Tailleux, Longueuil, both of Canada, assignors to Equipment Precibec Inc., Montreal, Canada

Filed Nov. 12, 1976, Ser. No. 741,549
Int. Cl.[2] B41I *45/00*
U.S. Cl. 101—76 **4 Claims**



1. In an offset press comprising a printing machine, a delivery machine cooperatively arranged relative to the printing machine for receiving the printed material discharged therefrom and delivering them to a point of deposit, and a numbering assembly comprising a numbering machine cooperatively

arranged on a shaft relative to the delivery machine to serially number the printed material passing therethrough an impression roller positioned beneath the numbering machine in cooperative relationship therewith and an inking device, said delivery machine including driving means and picking-up devices associated to said driving means for gripping the material discharged from the printing machine, said numbering machine including printing wheels having serial numbers thereon, a pawl for selectively stepping the printing wheels each time a number is to be impressed upon a sheet of printed material and a stop for actuating said pawl at each passage of a sheet of printed material, the combination therewith of a control assembly comprising:

a first electrical circuit comprising detection means responsive to the presence and absence of gripped material, a first normally open switch and a relay connected in series, said detection means closing said first circuit when printed material is normally supplied and opening the same when printed material is missing, said first switch closing said first circuit for a short time at each rotation of the shaft of the numbering machine, said relay closing a second electric circuit for a predetermined period of time each time it receives an electric pulse,

said second electrical circuit comprising a main switch, said relay and a first solenoid connected in series, said main switch selectively deactuating the numbering assembly, said first solenoid operating first mechanical means which in turn closes a third electrical circuit,

said third electrical circuit comprising a switch operated by said first mechanical means, the main switch and a second solenoid, said second solenoid operating second mechanical means which brings the stop of the numbering machine in operative position into the path of the pawl so that the number to be impressed be stepped each time a sheet of printed material is passing through the numbering machine,

said first mechanical means operated by the first solenoid of the second electrical circuit comprising a first lever which is mounted on a central pivot and permanently provided with an oscillatory movement generated by a pullback spring and a cam mounted on the shaft of the numbering machine, blocking means connected to the first solenoid for holding said first lever in an operative position relative to the switch of said third electrical circuit when the second circuit is closed, and connecting means mounted on the ends of the first lever for transmitting the oscillatory movement of the later to the impression roller and inking device.

4,068,583

HAMMER ACTUATED DOT MATRIX PATTERN PRINTER

Fumio Sato, Higashiosaka; Shigeru Fujimura, and Toshio Urakawa, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1976, Ser. No. 713,246

Claims priority, application Japan, Aug. 12, 1975, 50-98252

Int. Cl.[2] G02B *5/12*

U.S. Cl. 101—93.04 **6 Claims**

1. A dot matrix pattern printer of the impact type comprising:

a. a vertical line element carrier;

b. a plurality of vertical line elements formed on the vertical line element carrier with a predetermined distance therebetween equal to one printed character width;

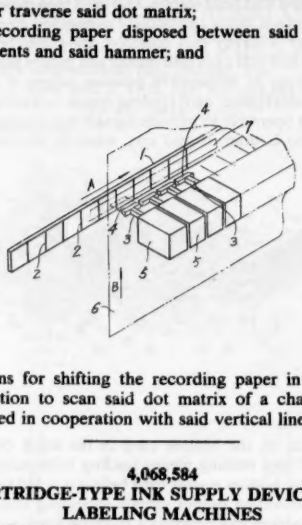
c. a driving means for driving the vertical line element carrier at a predetermined velocity in the lateral direction corresponding to a line of characters to be printed;

d. a hammer adjacent said vertical line element carrier;

e. means for actuating the hammer;

f. a projection fixed to the active end of the hammer, the projection having a predetermined length in the lateral direction substantially equal to the width of the dot matrix defining a said printed character and said hammer being responsive to said actuating means to impact said projection with selected ones of said vertical line elements as the latter traverse said dot matrix;

g. a recording paper disposed between said vertical line elements and said hammer; and



h. means for shifting the recording paper in the vertical direction to scan said dot matrix of a character to be printed in cooperation with said vertical line elements.

4,068,584

CARTRIDGE-TYPE INK SUPPLY DEVICE FOR LABELING MACHINES

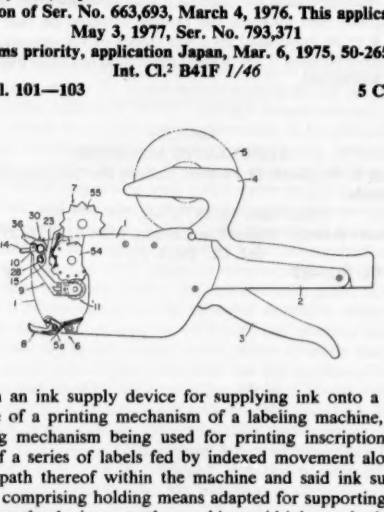
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Division of Ser. No. 663,693, March 4, 1976. This application May 3, 1977, Ser. No. 793,371

Claims priority, application Japan, Mar. 6, 1975, 50-26525

Int. Cl.[2] B41F *1/46*

U.S. Cl. 101—103 **5 Claims**



1. In an ink supply device for supplying ink onto a type surface of a printing mechanism of a labeling machine, said printing mechanism being used for printing inscriptions on each of a series of labels fed by indexed movement along a travel path thereof within the machine and said ink supply device comprising holding means adapted for supporting and attaching the device onto the machine; said ink supply device comprising an inking roller cartridge having at least one inking roller and a U-shaped inking roller support for supporting said inking roller, said U-shaped inking roller support having engaging means, said holding means comprising a cartridge holder adapted for holding said inking roller cartridge, said cartridge holder having a first part adapted to be detachably engaged with a part of the labeling machine and with a second part adapted to be detachably engaged with said former engaging means of said U-shaped inking roller support to support thereby said inking roller cartridge, the inking roller cartridge comprising a U-shaped inking roller support having a pair of side plates which are confronted with each other, at least one pivotal shaft supported by said side plates so as to be projected outward therefrom, and an inking roller supported by said pivotal shaft, said U-shaped inking roller support being provided with a fixing means; and the cartridge holder comprises a holder and an attaching member, said holder comprising a

pair of arms which are spaced for a predetermined distance, supporting means which comprise a pair of holding pieces unified with one side ends of said arms and having cut slots adapted to be engaged with the pivotal shaft of said U-shaped inking roller support, and a support pin adapted to be engaged with said fixing means of said U-shaped inking roller support, said attaching member being attached to other side ends of said arms and comprising support means for attaching the attaching member itself to the labeling machine thereby to attach said holder with the inking roller support to the labeling machine.

4,068,585

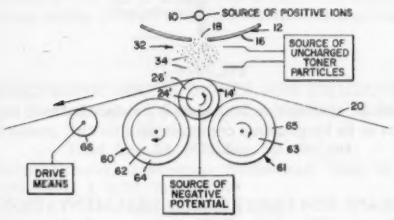
ELECTROSTATIC PRINTER SUPPORT WITH CONTROLLED ELECTROSTATIC SURFACE VOLTAGE

Lester E. Thompson, Los Altos, Calif., assignor to ElectroPrint, Inc., Cupertino, Calif.

Continuation of Ser. No. 359,287, May 11, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 608,940

Int. Cl.[2] B41F *15/00*; H01T *19/04*

U.S. Cl. 101—114 **29 Claims**



1. In a non-contact line printing apparatus of the type having a print receiving medium, a source of charged particles spaced from one side of the medium, an electrode on the other side of the medium to form an electric field in the space between the source and the medium so that charged particles are propelled by the field through space from the source to impinge the medium in a printing zone, and means for electrically modifying the field in accordance with an image to be reproduced, the improvement comprising: semiconductor or insulator means positioned between the electrode and the medium to provide a support surface for the medium and to cause the electric field in the space between the source and the print receiving medium to decrease continuously thoughout the printing zone from a print line in directions at right angles to the print line in the plane of the medium to thereby prevent ionization in the vicinity of the electrode said semiconductor or insulator means surrounding said electrode and being comprised of first and second materials of different resistivity, the first material comprising the portion of said semiconductor or insulator means lying between the electrode and the medium being of a material having a lower resistivity than the second material comprising the portion of the semiconductor or insulator means on the opposed side of the electrode.

4,068,586

CYLINDER FOR CLAMPING PRINTING PLATES

Rudolf Frey, Dirmstein; Joachim Bernauer, Frankenthal, and Pirmin Göbel, Lambsheim, all of Germany, assignors to Albert Frankenthal AG, Frankenthal, Germany

Filed Oct. 7, 1976, Ser. No. 730,398

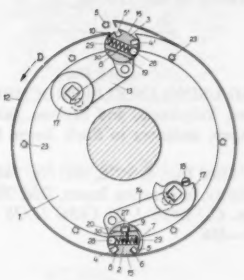
Claims priority, application Germany, Oct. 8, 1975, 2545124

Int. Cl.[2] B41F *21/06*

U.S. Cl. 101—415.1 **7 Claims**

1. A cylinder for clamping printing plates for photogravure printing, wherein the cylinder has at least one longitudinally-extending, bore opening onto the cylindrical, circumferential surface thereof, comprising:

at least one clamping spindle mounted for reciprocable-rotatable movement within said at least one bore of said cylinder for movement between a release position and a clamping position, said spindle having a longitudinally-extending, generally cylindrical, peripheral surface portion, which lies flush with the circumferential surface of said cylinder, when said spindle is in a clamping position, and a pair of longitudinally-extending grooves disposed on opposite sides of said cylindrical surface portion, one of which serves to retain one end of a printing plate and both



of which serve to retain sealing means, said spindle also including a generally flattened, peripheral surface portion adjacent to the side of said one-end retaining groove thereof, opposite the cylindrical surface portion, for retaining in cooperation with the surface of said bore of said cylinder, the other end of the printing plate; and

sealing means disposed with said grooves of said spindle for effecting sealing engagement of said spindle within said bore of said cylinder.

4,068,587

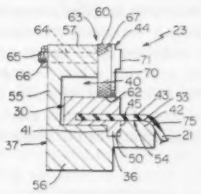
PRINTING BLANKET HOLDING APPARATUS

Jacob A. Bollmer, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 24, 1977, Ser. No. 771,588

Int. Cl.[2] B41F *29/04*

U.S. Cl. 101—415.1 **13 Claims**



1. Apparatus for holding an end portion of a printing blanket on an associated cylinder comprising; an elongate holding bar of roughly U-shaped cross-sectional outline having a pair of substantially equal length legs defining a channel for receiving said end portion of said blanket therewithin, said legs having planar outside surfaces, one of said legs having a projection extending perpendicularly from a terminal end portion of its planar outside surface, said projection having a lower portion of substantially U-shaped outline, and said projection having a bearing surface disposed perpendicular to said end portion of said blanket with said bearing surface being defined by a leg of the U-shaped outline of said lower portion; and a bar support for installation on said cylinder, said bar support having a roughly U-shaped cross-sectional outline and having a bight and a pair of parallel arms extending from opposite ends of said bight with said bight and arms defining a space in said bar support for receiving said holding bar therewithin, said bar support having a groove therein for receiving said projection therewithin, an extension shelf on said bar support extending

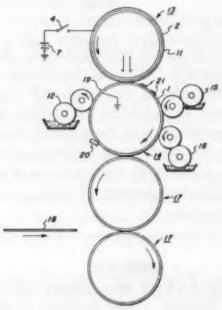
outwardly of said groove for supporting a part of said printing blanket thereon in spaced relation from said projection, and quick attach means for attaching and detaching said holding bar in said bar support; said bearing surface of said projection serving to carry loads applied against said blanket which tend to pull said holding bar out of said bar support; said projection being the sole means holding said holding bar and blanket against movements tending to pull said end portion of said blanket outwardly of said groove.

4,068,588

PRINTING USING AN ELECTROCHROMIC IMAGE

Keita Nakano, Yokohama, and Mutsuo Takenouchi, Isehara, both of Japan, assignors to Rank Xerox Ltd., London, England

Filed Dec. 8, 1976, Ser. No. 748,807
Claims priority, application Japan, Dec. 26, 1975, 50-154719
Int. Cl.[2] B41C *1/10*; G03G *13/28, 13/044*
U.S. Cl. 101—466 **6 Claims**



1. A printing method comprising forming a layer of electrochromic material on a conductive electrode, bringing an image recording element into contact with said electrochromic material said image recording member comprising a photoconductive layer contacting the electrochromic material, applying electromagnetic radiation in an image pattern to said photoconductive layer, applying a bias voltage to the conductive electrode to form a colored ink attractive image of said electrochromic material on said conductive electrode, applying ink to said image and transferring the ink image to an image receiving surface.

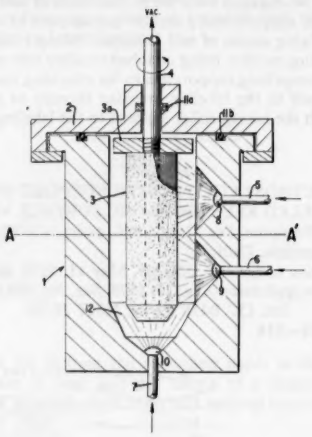
4,068,589

METHOD FOR THE PRODUCTION OF COMBUSTIBLE AMMUNITION CONTAINERS AND PRODUCT THEREOF

Wilhelm Oversohl, Koblenz-Karthause, Germany, assignor to Wasag Chemie AG, Munich, Germany

Filed Dec. 30, 1976, Ser. No. 755,653
Int. Cl.[2] F42B *5/06*
U.S. Cl. 102—43 R **18 Claims**

1. In a process for the manufacture of a combustible munitions container, wherein a hollow, water-permeable but fiber-impermeable, porous shape under suction is contacted with an aqueous suspension of nitrocellulose fibers, cellulose fibers, and synthetic resin binder material thereby forming a wet web, said web is pressed to remove free water, dried and hot-pressed to form a molded container, the improvements which comprise rotating said forming shape axially and contacting different longitudinal zones of said porous shape with a different aqueous suspension containing said fibers and said binder, the nitrocellulose fiber:cellulose fiber:binder ratio in each said suspension being different from the ratio in each other suspension,



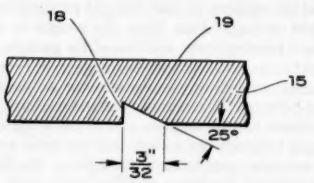
whereby an ammunition container is produced which is non-uniform in its longitudinal composition.

4,068,590

MEANS FOR CONTROLLED FRAGMENTATION

John Pearson, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1970, Ser. No. 67,245
Int. Cl.[2] F42B *13/48*
U.S. Cl. 102—67 **9 Claims**



1. A method of manufacturing a single-walled cylinder so that upon fragmentation thereof uniform sized fragments of a predetermined shape and mass are produced which comprises

forming indentations on the inner surface of the cylinder corresponding to a diamond-shaped pattern,

said pattern having the major axis of the diamonds disposed parallel to the longitudinal axis of the cylinder; and

the walls of said indentation having a steep and shallow side respectively.

4,068,591

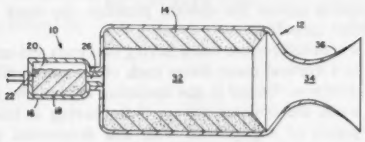
IGNITION SYSTEM USED IN TESTING SOLID PROPELLANT COMPOSITIONS FOR SMOKELESSNESS

Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 10, 1976, Ser. No. 665,490
Int. Cl.[2] C06D *5/00*
U.S. Cl. 102—70 R **1 Claim**

1. In an igniter for igniting a main solid propellant charge being tested for smokelessness, said igniter including in combination a casing having an inner combustion chamber and an orifice, an ignition material in said chamber, and means for initiating combustion of said ignition material whereby said

ignition material combusts and combustion products from said ignition material flow from said chamber through said orifice onto and thereby igniting said main solid propellant charge, the improvement comprising: said ignition material being of the same composition as said main solid propellant charge selected from propellant types consisting of composite and double base



propellant, said ignition material having a weight ratio of about 0.9–1.2 grams to a main solid propellant charge weight of about 60 grams, and said ignition material being detached small pieces of solid propellant having an aggregate burning web thickness of 0.03 cm or less so that said ignition material will combust within 10 msec after said initiation of combustion.

4,068,592

ELECTRONIC FIRING DEVICE FOR PROJECTILES

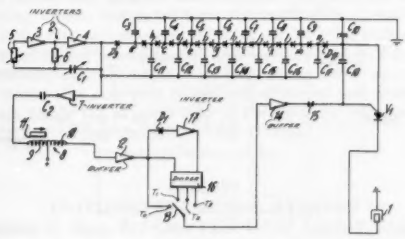
Roger Beuchat, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed June 23, 1975, Ser. No. 589,543

Claims priority, application Switzerland, July 5, 1974, 9247/74; June 2, 1975, 7070/75

Int. Cl.[2] F42B *9/08*

U.S. Cl. 102—70.2 R **5 Claims**



1. An electronic firing device for a pyrotechnic charge, comprising an electric fuse, a firing capacitor, a delay device, a controlled-conductivity semi-conductor element for delivering the charge of said capacitor to said fuse, an oscillator providing a pulsed output signal which is simultaneously applied, on the one hand, to means for charging said capacitor, and on the other hand, to the delay device as a clock signal, said delay device controlling said controlled-conductivity semi-conductor element.

4,068,593

DRIVING OF RAIL CLIPS IN MAKING A RAILWAY RAIL-AND-FASTENING ASSEMBLY

Geoffrey Gordon Leeves, Bearsted, England, assignor to Pandrol Limited, London, England

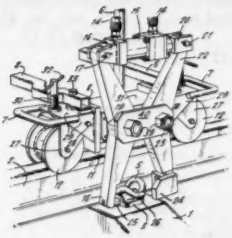
Filed Sept. 12, 1975, Ser. No. 613,026

Claims priority, application United Kingdom, Sept. 16, 1974, 40273/74

Int. Cl.[2] E01B *29/24*

U.S. Cl. 104—1 R **14 Claims**

1. Apparatus comprising wheels suitable for running along at least one of two rails of a railway track and for supporting the remainder of the apparatus, a spigot for entering one end of a passage afforded by one of two upward projections on opposite sides of a rail, a portion for engaging a clip a part of which is to be inserted into the other end of said passage and power-operated means for forcing said portion towards the spigot to drive said clip so that said part of it moves along said passage



towards the spigot and the clip is driven into a position for holding down the rail.

4,068,594

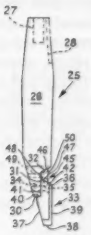
TAMPING TOOL

James E. Crowell, 708 Marlin Ave., Foster City, Calif. 94404

Filed Feb. 4, 1976, Ser. No. 655,078

Int. Cl.[2] E01B *27/00*

U.S. Cl. 104—10 **1 Claim**



1. A tamping tool for tamping railroad ballast and the like comprising:

a. an elongated shank having a lower portion formed with a lower extremity providing a bearing surface and an inset portion extending above such bearing surface and terminating at its upper end in an outwardly sloping first shoulder overlying the recessed area;

b. a foot member having a tip at its lower end which directly bears the impact of tamping, said foot member being formed with an inwardly directed second shoulder above said tip and a recessed portion extending above and overlying said second shoulder and terminating in an outwardly sloping upper extremity;

c. said foot member being detachably clamped to the lower portion of said shank with such second shoulder abutting said bearing surface and the face of the recessed portion of said foot member abutting the face of the recessed portion of said shank;

d. the upper extremity of said foot member being spaced from said first shoulder to provide a wedge-shaped cavity between the upper extremity and the first shoulder;

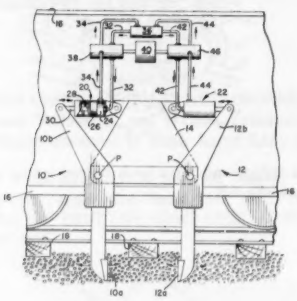
e. a wedge disposed within said cavity and bearing against the upper extremity of the foot member and said first shoulder to receive and transmit to the shank the impact of tamping, and

f. means detachably clamping said wedge to said shank.

4,068,595
TRACK TAMPER

Robert A. Weber, Pittsburgh, Pa., and Franz Allmer, Sophia, N.C., assignors to Graystone Corporation, Monroeville, Pa.

Filed Nov. 17, 1975, Ser. No. 632,696
Int. Cl.[2] E01B 27/16
U.S. Cl. 104—12 10 Claims



1. Track tamping apparatus of the type comprising a pair of opposed, vibrating tamper arms pivotally mounted on a carriage having means for positioning corresponding lower ends of the tamper arms on either side of a railroad tie and for drawing the vibrating arms together to compact the ballast thereunder, wherein the improvement comprises:

a pair of hydraulic piston assemblies operatively connected between the carriage and the upper ends of said tamper arms respectively such that reciprocation of each piston assembly causes pivotal reciprocable vibration of the respective tamper arms to aid in compacting the ballast, each said hydraulic piston assembly having a supply line and a return line for filling and evacuating hydraulic fluid from said piston assembly, respectively;

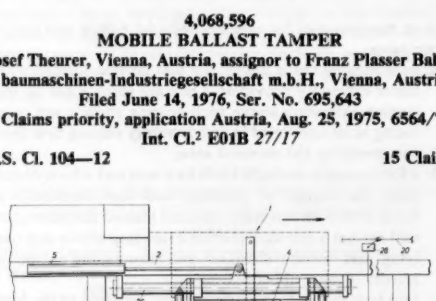
a pair of rotary valve means connected respectively to said piston assemblies for alternately communicating the supply and return lines for said respective piston assemblies with a common source of pressurized hydraulic fluid; and

drive means for imparting continuous rotation to each said rotary valve.

4,068,596
MOBILE BALLAST TAMPER

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed June 14, 1976, Ser. No. 695,643
Claims priority, application Austria, Aug. 25, 1975, 6564/75
Int. Cl.[2] E01B 27/17
U.S. Cl. 104—12 15 Claims



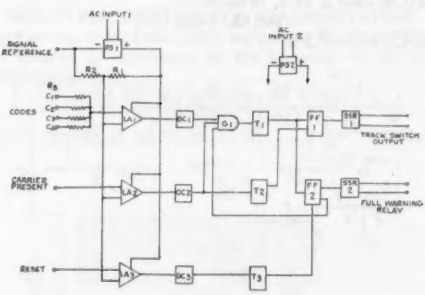
1. A mobile machine for tamping ballast underneath a track consisting of two rails fastened to a plurality of spaced ties resting on the ballast, the machine comprising

1. a frame
2. a tamping unit vertically movably mounted on the frame, the unit including
   a. a pair of vibratory tamping tools for tamping ballast under a respective one of the ties whereby the track is pressed upwardly, and
3. means mounted on the frame for holding the track in position against the upward pressure, the track holding means including
   a. a counterpressure beam having two ends and extending in a vertical plane above each of the track rails in the direction thereof in the operating area of the tamping tools, the counterpressure beam having at least three points of engagement with and downward pressure against, the associated rail, and
   b. power-actuated drives, a respective one of the drives being linked to the counterpressure beam in the region of each one of the beam ends for exerting downward pressure upon the beam ends and the beam ends engaging track rail points having a desired level.

4,068,597
CONVEYOR SYSTEM CONTROL CIRCUIT

Ernest P. Moyer, Frederick, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Sept. 13, 1976, Ser. No. 722,352
Int. Cl.[2] G06K 7/10
U.S. Cl. 104—88 16 Claims



1. In a system wherein a traveling mechanism is moved in a predetermined path and selectively controlled in its movement including an encoder unit mounted on the mechanism and a readout unit mounted along the path and wherein the encoder unit provides a code comprising a plurality of input signals and the readout unit reads the signals to actuate a control device along the path to determine the path of movement of the traveling mechanism, the improvement comprising

a control circuit associated with said encoder unit and comprising a readout circuit and a logic circuit,

said readout circuit including an AND circuit having an input for receiving signals from the encoder unit and transmitting an output signal when the code on the encoder unit matches the code on the readout unit,

said logic circuit having an input and an output,

means for coupling the output of said readout circuit and the input of the logic circuit while maintaining the readout circuit electrically isolated from the logic circuit,

and means for coupling the output of the logic circuit and the control device along the path of the traveling mechanism while maintaining the logic circuit and the control device electrically isolated from one another,

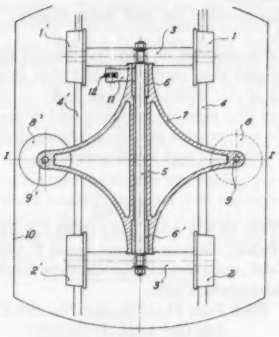
said readout circuit comprising a plurality of input buffers for sensing the presence or absence of an externally originating signal from said encoder unit and for sensing the presence or absence of simultaneous code signals from the encoder unit.

4,068,598

ELEMENT OF VEHICLE RUNNING ON RAILWAY TRACKS

Gerard Bardet, Arcueil, France, assignor to Automatisme & Technique, Arcueil, France

Filed Apr. 22, 1976, Ser. No. 679,455
Claims priority, application France, Apr. 23, 1975, 75.12706
Int. Cl.[2] E01B *7/00*
U.S. Cl. 104—130 **5 Claims**



1. A vehicle for running on the rails of a railway track having a switching junction, the vehicle comprising two axles, wheels on the axles for running along the tops of the rails, a bistable rockable lever between said axles, means supporting the lever for rocking on an axis at right angles to the axles, said lever having side portions extending out beyond said wheels, shunting wheels suspended from the outer ends of said side portions, crank means connected with said lever for rocking it, an eccentric for operating and locking the crank means, and means adapted to be actuated by fixed ramps beside the track for turning the eccentric to position either of said shunting wheels beside the adjacent side of the track for engagement with a side surface thereof.

4,068,599

UNITIZING FRAME FOR A PALLET

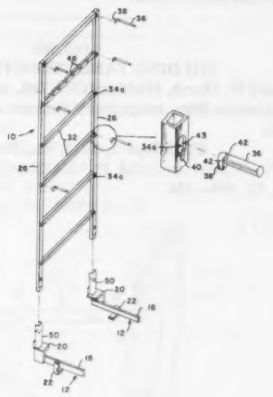
Lawrence G. Sapp, 621 Lone Palm Drive; James F. Slappey, Tillman Road, both of Lakeland, Fla. 33801, and C. Bart Nixon, 125 NW. 15th St., Oklahoma City, Okla. 73103

Continuation-in-part of Ser. No. 624,888, Oct. 22, 1975, Pat. No. 4,027,599. This application Sept. 22, 1976, Ser. No. 725,452
The portion of the term of this patent subsequent to June 7, 1994, has been disclaimed.
Int. Cl.[2] B65D *19/44*
U.S. Cl. 108—55.1 **9 Claims**

1. A unitizing frame for a four-way entry pallet, the pallet having an upper surface and including a pair of stringers extending along the sides of the pallet, the stringers having aligned cutout portions in the lower surfaces thereof to provide the four-way entry, and said pallet having an open area across its lateral dimension between the stringers, the unitizing frame comprising:

a pair of like panels having a width substantially equal to the lateral dimension of the pallet, said panels including side members extending the length of the panel;

means for unassistedly supporting said panels vertically on said pallet without obstructing the open area, said supporting means including a pair of bars each having a length substantially equal to the length of the stringers and a plurality of planar members including an upper plate at each end of each bar integral with each said bar and extending inwardly over the upper surface of the pallet, a side of each upper plate being substantially flush with an end of the pallet, and at least a pair of lower plates integral with each said bar and extending inwardly of said pallet in individual frictional contact with a portion of the lower surfaces of the stringers above the cut-out portions and means on said upper plates for stably, but removably, engaging the lower ends of said side members, said engaging means including means for preventing accidental disengagement of said lower ends of said side members, and said pair of panels interlocking said bars on said pallet; and



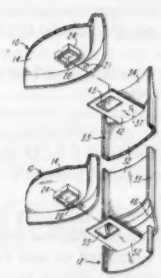
at least one pair of rod members for disengagingly interlocking each side member of one of said pair of panels to the opposing side member of the other of said panels when said panels are held vertically on said pallet by said pallet support means.

4,068,600

TABLE ASSEMBLY OF MOLDED PLASTICS MATERIAL

James R. Driscoll, 404 Winston Ave., Dayton, Ohio 45403

Filed Oct. 12, 1976, Ser. No. 731,363
Int. Cl.[2] A47B *3/06*
U.S. Cl. 108—111 **9 Claims**



1. A table assembly adapted to be conveniently and quickly erected, comprising a tray member including a generally horizontal bottom wall portion integrally connected to an upwardly projecting peripheral rim portion, said rim portion including a downwardly projecting skirt portion and having generally an inverted U-shaped cross-sectional configuration to define an open bottom peripheral cavity, a plurality of peripherally spaced leg members each including an upper lip portion projecting upwardly into said cavity and engaging said skirt portion of said tray member, means connecting said lip portion of each leg member to said skirt portion of said tray member for limiting relative vertical movement between said tray and leg members, each said leg member including an integral generally horizontal flange portion projecting inwardly from generally the base of said lip portion under said

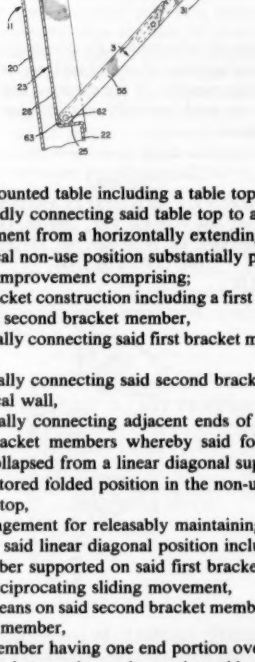
bottom wall portion of said tray member, snap-type latch means connecting said bottom wall portion of said tray member with said flange portion of each said leg member to limit relative horizontal movement between said tray member and each said leg member, and said inwardly projecting flange portion of each said leg member being slightly flexible relative to said lip portion of said leg member to effect connection of each said latch means.

4,068,601

FOLDING TABLE CONSTRUCTION

Ronald W. Marsh, Michigan City, Ind., and Grant M. Newbury, Shawano, Wis., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sept. 2, 1976, Ser. No. 720,020
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—134 **10 Claims**



1. A wall mounted table including a table top,
means hingedly connecting said table top to a vertical wall for movement from a horizontally extending use position to a vertical non-use position substantially parallel to said wall, the improvement comprising;
a folding bracket construction including a first bracket member, and a second bracket member,
means pivotally connecting said first bracket member to said table top,
means pivotally connecting said second bracket member to said vertical wall,
means pivotally connecting adjacent ends of said first and second bracket members whereby said folding bracket may be collapsed from a linear diagonal supporting position to a stored folded position in the non-use position of said table top,
a latch arrangement for releasably maintaining said folding bracket in said linear diagonal position including,
a latch member supported on said first bracket member for relative reciprocating sliding movement,
first guide means on said second bracket member for guiding said latch member,
said latch member having one end portion overlapping said second bracket member and engaging said second bracket member at a point laterally spaced to one side of said means pivotally connecting said adjacent ends of said first and second bracket members in the linear position of said folding bracket and thereby lock said bracket members against folding movement,
manually operated means on said latch member for moving said latch members whereby said one end portion is laterally movable to another side of said pivotal means connecting said adjacent ends of said bracket members and is disengaged from said second bracket member whereby said folding bracket and table top may be moved to said collapsed position,
said one end portion comprising a guided extension having a rounded edge,
said one end portion and guided extension having spaced side wall portions providing a groove,
said first guide means on said second bracket slidably engaging said groove in guiding relation, said first guide means on said second bracket comprising a boss projecting from said second bracket,
said side wall portion of said extension having a concave upper surface,
a first stop member on said latch member having a stop surface,
a second stop member on said first bracket member engageable by said stop surface of said first stop in the linear position of said folding bracket, and
said second stop member engaging said undercut surfaces of said side wall portion in sliding relation during reciprocating movement of said latch member.

4,068,602

COATED SEED AND METHOD OF SEEDING

Robert R. Mickus, Sacramento, and James T. Munson, Robbins, both of Calif., assignors to Rice Growers Association of California, Sacramento, Calif.

Filed June 21, 1976, Ser. No. 698,423
Int. Cl.[2] A01C *1/06, 7/00*
U.S. Cl. 111—1 **4 Claims**

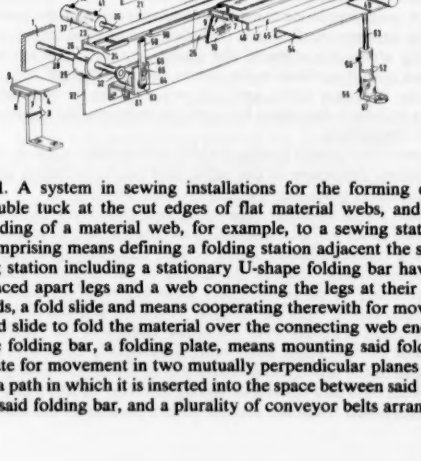
1. The method of seeding a flooded rice paddy comprising:
coating each individual rice seed with a coating consisting essentially of a liquid saccharide and talc to increase the weight of the seed by at least 20%,
passing said coated seeds to a finishing step wherein the seeds become discreet and free flowing, and
applying said seeds in the absence of presoaking to said rice paddy by aerial broadcast.

4,068,603

APPARATUS FOR FEEDING MATERIAL FOR FORMING A DOUBLE TUCK ON THE CUT EDGES THEREOF

Conrad Arbter, Mittelweg 9, Saal an der Saale, Germany (8741)

Filed Sept. 15, 1976, Ser. No. 723,229
Claims priority, application Germany, Oct. 3, 1975, 2544409
Int. Cl.[2] D05B *19/00, 35/04, 27/08*
U.S. Cl. 112—121.11 **12 Claims**



1. A system in sewing installations for the forming of a double tuck at the cut edges of flat material webs, and for feeding of a material web, for example, to a sewing station, comprising means defining a folding station adjacent the sewing station including a stationary U-shape folding bar having spaced apart legs and a web connecting the legs at their one ends, a fold slide and means cooperating therewith for moving said slide to fold the material over the connecting web end of the folding bar, a folding plate, means mounting said folding plate for movement in two mutually perpendicular planes and in a path in which it is inserted into the space between said legs of said folding bar, and a plurality of conveyor belts arranged

in opposite pairs and clamping the material web between pairs, the improvement comprising at least one movable conveyor belt engaging at the material in the vicinity of the tuck portion to move the material in a feed direction, and auxiliary feed means engageable with the material for driving the material briefly and at a rate faster than said conveyor belts engaging the material in the vicinity of the tuck portion.

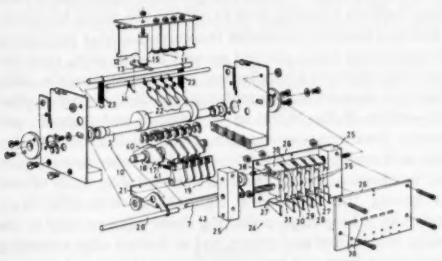
5. A method of advancing material to a sewing needle which includes at least one edge having a double tuck and using a U-shaped folding plate about which the material is tucked, comprising positioning the material on the folding plate and folding it downwardly over the connecting web of the U-shape portion, thereupon, folding it substantially horizontal into engagement with the lower leg of the folding plate, subsequently folding the free end over the edge of the lower leg of the U-shape folding plate and into the space between the legs thereof, engaging at least one side of the material along a considerable portion of its length and advancing it in a feeding direction toward the sewing machine needle and, at least directly before it is fed into the needle, advancing the material by separate feed means which is engaged with the opposite side of the material adjacent the end which is folded over the leg of the U-shape folding bar to advance it at a speed greater than the traveling speed of the material.

4,068,604

SEWING MACHINE

Kenneth Oscar Emanuel Skogward, Jonkoping, Sweden, assignor to Husqvarna AB, Sweden

Filed May 28, 1976, Ser. No. 691,098
Claims priority, application Sweden, May 28, 1975, 7506074
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E **3 Claims**



1. In a sewing machine for stitching material, said sewing machine comprising motor means for powering said sewing machine;

needle means, responsive to said motor means, for forming stitches;

zig-zag means for controllably displacing said needle means in a direction angularly displaced from the path of material through the machine to form a zig-zag stitch pattern, said improvement of said zig-zag means comprising:

control means, responsive to manual setting of a desired stitch pattern, for providing a control signal indicative of a desired displacement of said needle means from said path of material through said machine;

converter means, responsive to said control means, for producing a variable thickness, said thickness varying according to said desired displacement, said converter means comprising a plurality of packet means for providing a variable thickness, said thickness variable between a thick and thin position;

electromagnetic activating means for operating said packet means between said thick and thin positions;

linkage means for sensing said variable thickness of said converter means and displacing said needle means in response thereto;

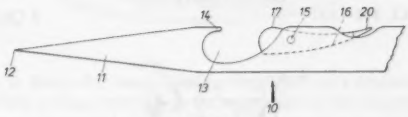
said packet means comprising at least two plates, each of said plates having at least one raised portion and one flat portion, said plates, acting in cooperation with said raised and flat portions, providing a variable thickness of said packet means when said plates are moved relative to each other, said packet means further comprising rocker means, responsive to both plates of said packet means, for moving one of said plates in response to movement of the other of said plates in the opposite direction, said movement varying the thickness of said packet means between a thick and thin position.

4,068,605

NEEDLES

Denis Matthews, Sutton-in-Ashfield, England, assignor to Mathbirk Limited, England

Filed Nov. 22, 1976, Ser. No. 743,796
Claims priority, application United Kingdom, Nov. 12, 1975, 50933/75; Dec. 20, 1975, 52292/75
Int. Cl.[2] D05B *85/14*
U.S. Cl. 112—223 **6 Claims**



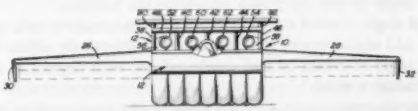
1. An imperforate needle for use with a textile linking machine, comprising an elongated shank having a pointed end and a cut-out with an inlet opening for inserting a thread through the latter and into said cut-out, said cut-out having a dimension in a direction substantially transverse to the direction of elongation of said shank, which is substantially commensurate with the thickness of said shank; and a latch element having at least two portions spaced from each other, said latch element being pivotable between a closed portion in which one of said portion bridges said inlet opening of said cut-out so as to close the same, and a second position in which said one portion of said latch element is retracted from said inlet opening and located substantially within the outer circumference of said shank as seen in said transverse direction, whereas the other portion of said latch element in said second position at least partially extends into said cut-out so as to be engaged by the thread during insertion of the latter in said cut-out whereby said latch element is pivoted from said open into said closed position.

4,068,606

SURFACE EFFECTS AIR VEHICLE

John Van Veldhuizen, 25975 SW. 182 Ave., Homestead, Fla. 33030

Filed Oct. 15, 1976, Ser. No. 732,991
Int. Cl.[2] B63B *1/34*
U.S. Cl. 114—67 A **14 Claims**



5. In an air cushion support system of the type including a rigid vehicle body having a bottom structure, said bottom structure including a rigid bottom plate, a plurality of parallel, elongated and horizontal downwardly projecting inflatable bottom surface members supported from and disposed beneath said bottom plate, said plate being elongated and said bottom surface members extending longitudinally of said plate, means defining crossed and intersecting horizontal air plenums above said bottom plate, air supply means operative to supply air

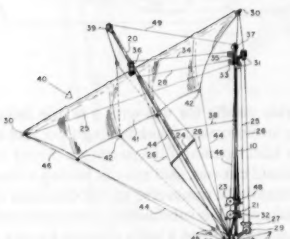
under pressure into said air plenums, each of said air plenums crossing each of said inflatable bottom surface members in vertical registry therewith, and air transfer means communicating those portions of said bottom surface members crossed by said air plenums with the interiors of said plenums for inflation of the bottom surface members by air supplied thereto from said plenums.

4,068,607

CONTROLLABLE WING SAIL

G. Lamar Harmon, 1362 Granville Drive, Winter Park, Fla. 32789

Filed Sept. 10, 1976, Ser. No. 722,159
Int. Cl.² B63H *9/06*
U.S. Cl. 114—102 **3 Claims**



1. A sail and rigging comprising:

a vertical mast installable on a hull;

at least one boom pivotally attached to said mast at a point near the base of said mast, said boom pivotable in a vertical plane;

a yard disposed near the outer end of said boom and maintained essentially at right angles to said boom;

an essentially rectangular cambered sail having the span of said sail greater in length than the chord of said sail with the upper edge of said span attached to said yard;

boom control means operatively connected to said boom, said boom control means effective to selectively adjust the vertical angle of said boom with respect to said mast;

yard control means operatively connected to said yard, said yard control means effective to selectively adjust the angle of said yard with respect to the horizon;

sail angle control means operatively connected to said sail, said angle control means effective to selectively adjust the angle of attack of said cambered sail with respect to the relative wind;

sail trimming control means operatively connected to said sail, said sail control means effective to selectively control the angle of attack of at least one portion of said sail with respect to other portions of said sail; and

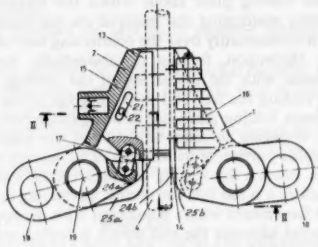
rigging means for erecting and lowering said sail, said rigging means operative to maintain said sail when in the erected condition supported in a kite-like fashion and arranged to transfer the force of a wind incident on said sail to the center of effort of the hull whereby said hull is propelled by such force without an overturning moment from the force of the wind on said sail.

4,068,608

CABLE STOPPER

Peter Hartz, Langen, Germany, assignor to Aktien-Gesellschaft "Weser", Bremen, Germany

Filed Feb. 20, 1976, Ser. No. 659,856
Claims priority, application Germany, Feb. 28, 1975, 2508764
Int. Cl.² B63B *21/08*
U.S. Cl. 114—199 **20 Claims**



1. A device for clamping and stopping elongated objects, particularly cables, comprising means defining a passage adapted to receive at least an elongated section of the object to be clamped and stopped, said means defining said passage being a casing having an equilateral trapezoidal configuration bounded by bottom and top walls spaced from each other by elongated rectangular side walls, said casing having on the wide lower and the narrow apex side thereof an aperture for passage of a cable; said casing having a hinge-like configuration formed by a pair of equal half-portions, suspended in their bottom walls on a joining stem parallel to the casing longitudinal axis and limitedly pivotable thereupon, so that said casing half-portions, in being pivoted on said joining stem, open between their top walls a longitudinal gap for insertion of a cable, at least two jaws located in said passage adjacent to said elongated section of the object to be clamped and stopped, said clamping jaws being arranged in a pair against one another within said casing, slidable therein and movable toward each other to clamp and stop therebetween a cable, each of said jaws having the form of a right-angled triangular body bounded by a base edge, a slanting distal edge parallel to the adjacent side wall of said casing, and an inward edge extending at right angle from said base edge, so that the inward edges of said jaws extend parallel to one another; means mounting said jaws in said casing for displacement toward and away from said elongated section to thereby clamp and release said elongated object, said mounting means including guide walls of said casing which converge in the longitudinal direction of said passage, and surfaces on said jaws which engage said casing guide walls, so that the jaws slide along said guide walls during said displacement; means for shifting said jaws in longitudinal direction inside said casing, so that the shift of said jaws toward the apex region of said casing causes said jaws to slide on their slanting distal edges along said casing guide walls, to approach one another on their inward side edges and thus to provide in various longitudinal positions thereof different spacings between each other to compress along their entire lengths from either side cables of various diameters, said shifting means being lateral double-arm levers pivotally attached to said casing, each having an internal and an external arm, each being coupled on its internal arm to one of said jaws proximate thereto, so that the actuating of the corresponding one of said external arm produces motion of the corresponding one of said jaws in the longitudinal direction of said casing, each of said external arms being provided with a means for attachment thereto of an actuating means, said actuating means being a tug coupled at one end thereof to each of said attachment means and provided at the other end thereof with a looped means for its connection to a stationary support structure providing local

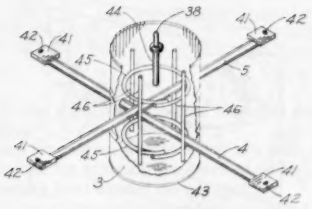
anchoring of said casing, the tugs having said connecting looped means in common.

4,068,609

MOORING ANCHOR

Carl H. Hoetker, Jr., 615 8th Ave., San Diego, Calif. 92101

Filed Nov. 10, 1975, Ser. No. 630,208
Int. Cl.[2] B63B *21/34*
U.S. Cl. 114—301 **2 Claims**



1. An anchor comprising:

a. a metal drum completely closed at one end having the other end entirely open;

b. two pairs of oppositely disposed holes provided in the walls of said drum; the holes of one pair being spaced longitudinally with respect to the holes of the second pair, and disposed on the drum at right angles to the holes of the second pair; the pairs of holes being located substantially equal distances from the respective ends of said drum;

c. straight rods extending through the pairs of holes, said rods having central portions within said drum and portions of equal length radiating from a central axis perpendicular to the rods;

d. a ring centered outside the open end of said drum, said ring having a shank portion extending within the drum;

e. poured concrete completely filling said drum from end to end; said rods and said ring secured against relative movement by the concrete upon curing; and

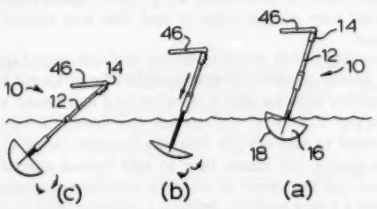
f. flukes of rectangular shape affixed to the ends of each rod by welds or other means; the surface of each fluke being parallel to the ends of said body.

4,068,610

SKI PROPULSION POLES

Riccardo Tesan, 2397 Finch Ave. W., Weston, Canada

Filed Dec. 6, 1976, Ser. No. 747,666
Int. Cl.[2] B63H *16/04*
U.S. Cl. 115—24.1 **10 Claims**



1. A propulsion pole or paddle for use by an operator in self-propulsion on a mobile conveyance relative to a medium, said paddle including a lower portion for engaging the medium on propulsive thrust;

a shaft extending upwardly from said lower portion and having at its upper portion a handle adapted to be gripped by the hand of an operator;

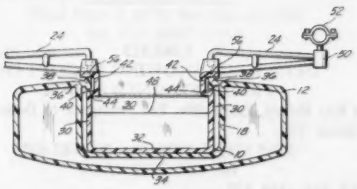
an arm supporting means pivotally secured to said shaft for angular movement relative thereto substantially in a single plane, and including biasing means urging the shaft in a direction towards the arm of the operator when gripping said handle, said arm supporting means also being adapted to releasably engage the arm of an operator when the operator grips said handle.

4,068,611

BOAT CONVERSION DEVICE

Richard B. Leather, 50 Valley Road, Plandome, N.Y. 11030

Filed Sept. 24, 1976, Ser. No. 726,643
Int. Cl.[2] B63H *16/06*
U.S. Cl. 115—24.1 **38 Claims**



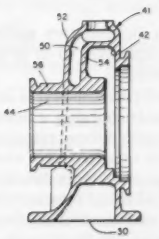
1. A device for use in a sailing vessel, having a footwell, to provide rowing capability to the vessel, said device comprising a one piece molded shell adapted to be mounted in the footwell of said sailing vessel and including means for providing a generally horizontal seating surface therein, and a pair of oppositely extending outrigger support structures operatively connected to said shell, each of said support structures including an oar lock mounted therein for receiving a rowing oar; and said means for providing a seating surface comprising an integral seat molded in said one piece shell.

4,068,612

TURBOCHARGER HOUSING CONSTRUCTION FOR MARINE TURBOCHARGER AND DEVICE FOR TURBOCHARGING A MARINE ENGINE

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Continuation-in-part of Ser. No. 652,184, Jan. 26, 1976, abandoned. This application Sept. 2, 1976, Ser. No. 719,848
Int. Cl.[2] B63H *21/14*
U.S. Cl. 115—76 **7 Claims**



1. In a turbocharger for marine engines of the type including a compressor housing, an impeller in the compressor housing, a turbine housing, a turbine wheel in the turbine housing, a drive shaft connecting the turbine wheel and impeller, the improvement of a fluid shielding manifold structure integral with the turbine housing, said turbine housing defining a toroidal passage for exhaust gases, an inlet to the toroidal passage from the engine at the outer toroid surface, an outlet from the inner toroid surface to the center passage in the housing, the center passage including the turbine wheel, a second separate substantially toroidal passage concentric with the first passage positioned radially outward from the first passage, said second

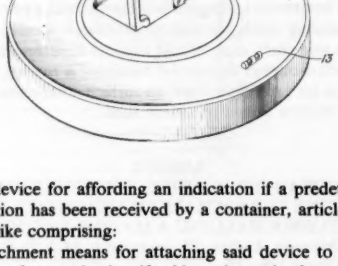
passage being separated from the first passage by a wall and its opposite ends adjacent the first toroidal passage exhaust inlet to define a fluid flow path substantially surrounding the first passage, said second passage also including a cooling fluid inlet at one end and a cooling fluid outlet at the other end for connection with the fluid cooling system of the marine engine, said second passage defining an L-shaped cross-section and said first passage defining a generally rectangular cross-section bounded on only two sides by the second passage to shield the first passage, the turbine housing being attached to the compressor housing at an unshielded side of the compressor housing.

4,068,613

DEVICE FOR SHOWING RECEIPT OF PREDETERMINED SHOCK

Ulyss Ray Rubey, Lewisville, Tex., assignor to Detectors, Inc., Graham, Tex.

Filed May 3, 1976, Ser. No. 682,605
Int. Cl.[2] G01P *15/04*
U.S. Cl. 116—114 AH **9 Claims**



1. A device for affording an indication if a predetermined acceleration has been received by a container, article, object and the like comprising:

a. attachment means for attaching said device to the container for monitoring if said predetermined acceleration has been received;

b. measuring means for measuring if said predetermined acceleration has been received; said measuring means being connected with said attachment means; and comprising:

i. a structure for holding two materials adjacent each other in a configuration so as to define an interfacial barrier therebetween;

ii. at least two materials disposed in said structure, at least one of said materials being a liquid in the form of a reservoir that will deform responsive to acceleration and return to its original shape when said acceleration ceases if said acceleration is below said predetermined acceleration; said liquid reservoir being disposed adjacent the other said material to effect an interfacial tension and define an interfacial barrier therebetween, said interfacial tension and said structure being chosen such that said predetermined acceleration effects rupture of said interfacial barrier such that at least a droplet of said liquid breaks away from said liquid reservoir;

iii. closures sealingly connected with said structure sealingly holding said materials therewithin so as to prevent flow of said liquid from said structure; and

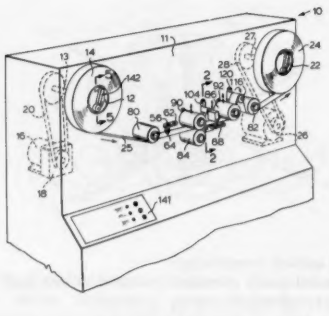
c. indicator means comprising visual means disposed adjacent said other material and said interfacial barrier for indicating when said interfacial barrier has been ruptured by said predetermined acceleration; said visual means being adapted for enhancing the visual indication that at least said droplet has separated from said liquid reservoir.

4,068,614

MACHINE FOR APPLYING LIQUID TO ABSORBENT MATERIAL

Slavco A. Kopachkov, Toronto, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed May 7, 1976, Ser. No. 684,196
Int. Cl.[2] B05C *1/04*
U.S. Cl. 118—6 **11 Claims**



1. An apparatus comprising:

first hub means mounted for rotation about its axis and adapted to receive a take-up spool for a band of impregnated material;

drive motor means operatively connected to said first hub means for driven rotation of said first hub means on its axis;

second hub means spaced apart from said first hub means and mounted for rotation about its axis and adapted to receive a source spool of a band of material for impregnation;

brake motor means operatively connected to said second hub means for application of braking force to said second hub means;

said first and second hub means being mounted for rotation about parallel spaced upright axes on axles extending through an upright face of apparatus frame means;

band flow path defining means located between said first and second hub means for guiding said band of material for impregnation between said first and second hub means and comprising a plurality of roll means mounted for rotation about horizontal axes which are parallel to each other and to said axes of said axles of said first and second hub means;

said plurality of roll means including first and second spaced roll means mounted to said upright face at locations respectively adjacent said first and second hub means, a pair of upper and lower roll means, the lower of which is mounted to said upright face at a location closer to said first spaced roll means than to said second spaced roll means and the upper of which is vertically movable between a lower position defining a material band contacting position and an upper inoperative position, and a third roll means located closer to said second spaced roll means than said pair of roll means;

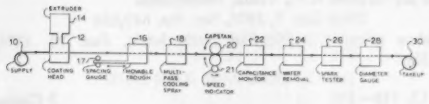
liquid applicator means located adjacent said band flow path for application of liquid material to said band of material; and

control means associated with said drive motor means, brake motor means and liquid applicator means for controlling the application of liquid material to said band of material at a substantially uniform level.

4,068,615
CONTROL FOR WIRE COATING LINE

Victor Louis LeNir, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 10, 1976, Ser. No. 740,354
Claims priority, application Canada, Nov. 1, 1976, 264575
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—6 15 Claims

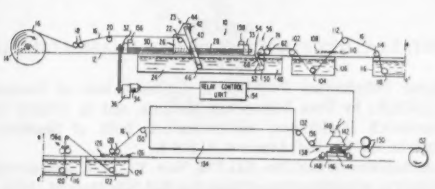


1. In the provision of plastic insulated wire by apparatus including:
means for causing wire to travel in a path,
a control for adjusting the speed of said travel,
a coating head located on said path,
a molten plastic extrusion means connected to provide molten plastic to said extrusion head,
said head being designed to cause the application of a layer of such molten plastic to such wire passing said head,
a control for the temperature of such molten plastic,
a control for the extrusion rate,
cooling means for cooling the plastic coated wire travelling out of said head,
the spacing between said cooling means and said head being adjustable,
a control for said spacing,
means for obtaining an analogue measure of the capacitance of plastic insulated wire formed on said path,
means for converting said capacitance measure to a digital value representative thereof,
means for comparing said digital value to a preset capacitance digital value representative of the desired capacitance and obtaining a digital correction value which is a function of such two digital values,
means actuable by said digital correction value to produce an analogue signal to control said extrusion rate in a sense to reduce the difference between said two digital values.

4,068,616
APPARATUS FOR TREATING PLASTIC FILM

Sidney J. Baum, Encino, and Anton J. Mayr, Canoga Park, both of Calif., assignors to Foster Grant Co., Inc., Leominster, Mass.

Division of Ser. No. 308,633, Nov. 21, 1972, Pat. No. 3,992,141.
This application May 4, 1976, Ser. No. 683,147
Int. Cl.[2] B05C *3/12*
U.S. Cl. 118—8 9 Claims

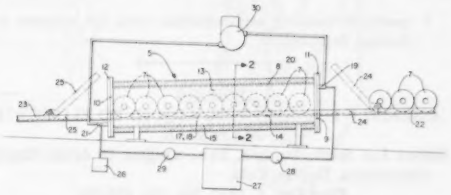


1. An apparatus for processing thermoplastic film including a receptacle for containing a bath of a liquid treatment solution, driven roll means for drawing a length of film to be processed longitudinally through the apparatus, and guide roll means for guiding a bight of the moving film through said bath, the improvement comprising a first pair of squeeze rolls mounted in closely spaced relation to the top surface of said liquid dye solution and resiliently urged into engagement with one another, means for drawing said film upwardly from said dye bath through the nip of said pair of squeeze rolls to mechanically roll any adhering dye solution from the surface of said film, and an elongated spray bar extending over the exit nip of said pair of squeeze rolls for supplying a rinsing liquid into the exit side of said nip to rinse the surface of the film passing therethrough and permitting the rinsing liquid to continuously flow from said exit side of said nip at the ends of said squeeze rolls.

4,068,617
APPARATUS FOR COATING WIRE ON A SPOOL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 3, 1976, Ser. No. 682,709
Int. Cl.[2] B05C *3/109*
U.S. Cl. 118—50 8 Claims



1. An apparatus for coating a continuous element, such as a wire tire cord, wound on a spool comprising:
a. an elongated chamber having openings at opposite ends, closures at said ends for said openings to permit the passage of said spool and for sealing from the ambient atmosphere, said chamber having a transverse cross section larger than the longitudinal cross section of said spool;
b. a trackway extending longitudinally of said chamber for guiding said spool through the chamber,
the trackway having a width at least as great as the length of said spool and being inclined from the horizontal such that said spool will roll, by gravity, along the trackway;
c. means for circulating liquid coating, under pressure, to the chamber;
d. means for creating at least a partial vacuum in the chamber;
e. means coacting with the vacuum creating means (d) for alternately creating fluid pressure in the chamber;
f. outlet means for removing residual liquid coating from said chamber; and
g. means for circulating a heated fluid through the chamber to dry liquid coating on the element.

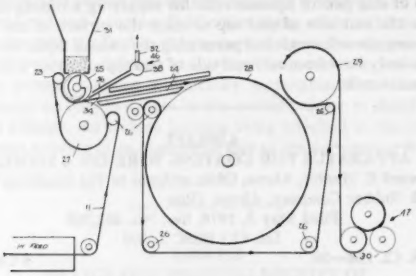
4,068,618
APPARATUS FOR MAKING MATERIAL WITH FUSIBLE BACKING

Robert Greenberg, New York, N.Y., assignor to Trufuse International Ltd., Long Island City, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,596
Int. Cl.[2] B05C *19/00*
U.S. Cl. 118—60 15 Claims

1. Apparatus for manufacturing a fusible interlining consisting of a fabric substrate to which a fusible polymer is applied, comprising:
a. a rotating screen printing drum;
b. means for holding the substrate in contact with said drum over a substantial portion of its circumference;
c. means applying a free flowing polymer dust to the other side of said printing drum, said means feeding polymer dust to the inside of said drum over said portion with which said substrate is in contact;
d. means for removing said substrate from said screen after polymer dust has been deposited thereon;
e. a reverse doctor blade inside said drum arranged so as to

scrape excess polymer material from the inside of said drum at the point where said substrate is removed from said drum; and



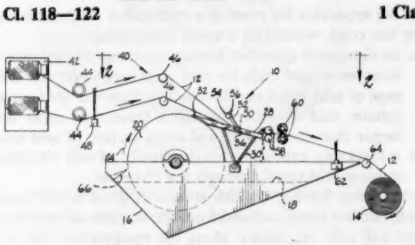
f. means for heating said substrate with the polymer dust thereon from below.

4,068,619

ASSEMBLY FOR APPLYING LIQUID TO ELONGATED MATERIAL

Robert Lee Batts, Denison, Tex., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Dec. 5, 1975, Ser. No. 638,014
Int. Cl.[2] B05C *11/02*
U.S. Cl. 118—122 **1 Claim**



1. An assembly for applying a liquid resin material to fibers, said assembly comprising:

a. a container having therein a supply of said resin;

b. a rotatably mounted roller at least partially located within said container, a portion of said roller being submerged within said supply of resin and a portion being located outside said supply;

c. means including a stationary substantially flat surface having one end in engagement with an unsubmerged portion of said roller and an opposite end spaced from and out of engagement with said roller, said flat surface being at an incline with the horizontal such that said spaced end is below said roller engaging end;

d. means for rotating said roller such that some of the resin in said container moves onto said roller and from said roller onto said flat surface; and

e. means supporting said fibers for movement over and against said flat surface through the liquid resin on said surface, whereby to coat said fibers with said resin, said supporting means including stationary means for pressing said moving fibers against said surface and in said resin, said fibers supporting means further including

i. a first pair of adjacent stationary squeeze rods located adjacent to but spaced from said spaced end of said flat surface and a second pair of adjacent stationary squeeze rods located between said first pair of rods and the spaced end, said squeeze rods being positioned such that said fibers, after being coated with said resin, pass through and are squeezed by each of said pair of rods and said first pair of rods including squeezing surfaces constructed of material of predetermined hardness and wherein said second pair of rods includes squeezing surfaces constructed of material harder than the material of said first pair, and

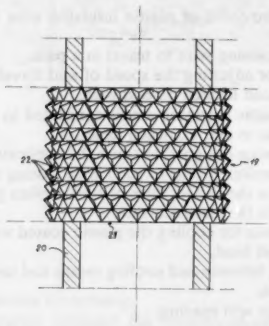
ii. a number of means in direct contact with said fibers, all of said direct contacting means being stationary.

4,068,620

PROFILED ROLLER

Wilhelmus G. M. Peters, Venlo, Netherlands, assignor to Ocevan der Grinten N.V., Venlo, Netherlands

Filed Jan. 7, 1976, Ser. No. 647,054
Claims priority, application Netherlands, Jan. 13, 1975, 7500351
Int. Cl.[2] B05C *1/00*; B21B *27/02*
U.S. Cl. 118—249 **3 Claims**



1. A profiled roller comprising a core and a sleeve thereon composed of a multiplicity of contiguous identical rings, characterized in that each said ring is provided with a peripheral series of protuberances recurring *n* times circumferentially of the ring, the tops of which have open spaces therebetween and with the tops of the protuberances of the other rings define a cylindrical roller outline, each said ring being turned circumferentially relative to a contiguous ring at an angle thereto of less than $360°/n$ and each said ring being provided on one of its sides with at least one projection and on its other side with at least one recess each complementary to at least one said projection, each said recess being located circumferentially away from a said projection at an angle relative thereto equal to the aforesaid angle, the tops of said protuberances each having a surface area of less than 0.5 mm^2, and the tops of successive protuberances of each ring being spaced apart by a distance of between 1.5 mm and 5 mm, measured along the circle described by said tops, said open spaces each having an area of at least 1.5 mm^2 to 2 mm^2.

4,068,621

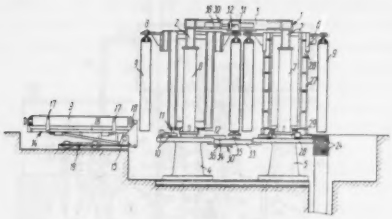
INSTALLATION FOR CONTINUOUS ENAMELLING OF PIPES

Evgeny Nikolaevich Podkletnov, deceased, late of Moscow, U.S.S.R.; by Vera Matveevna Malkina, and by Evgeny Evgenievich Podkletnov, administrators, both of Smolenksy bulvar, 6-8 kv. 144, Moscow, U.S.S.R.

Continuation of Ser. No. 632,776, Nov. 17, 1975, abandoned, which is a continuation of Ser. No. 537,700, Dec. 31, 1974, abandoned. This application Dec. 23, 1976, Ser. No. 753,937
Int. Cl.[2] B05C *5/00*
U.S. Cl. 118—620 **5 Claims**

1. An apparatus for continuous enameling of pipes comprising: at least three working stations comprising in succession at least one working station including means for applying an enamel slip coating to at least one side of a pipe, at least one working station including means for drying the enamel slip coating and at least one working station including means for baking the enamel slip coating; two rotors mounted vertically

side by side and provided with grips for holding pipes in a vertical position, one of the rotors serving to receive and discharge the pipes and the other of the rotors serving as a working rotor for moving the pipes along the at least three working stations disposed along the path of movement of the working rotor; means for transferring the pipes from the receiving and discharging rotor to the working rotor and from the working rotor to the receiving and discharging rotor; a



conveyor means adjoining the receiving and discharging rotor for moving the pipes in a horizontal position and transferring the pipes thereto and therefrom, the conveyor means including a turnover device for shifting the pipes from the horizontal position to the vertical position as the pipes are transferred to the receiving and discharging rotor, and from the vertical position to the horizontal position as the pipes are transferred from the receiving and discharging rotor to the conveyor means.

4,068,622

MAGNETIC ROLLER

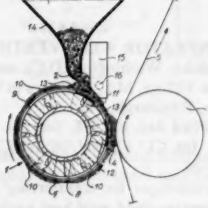
Mathias J. J. M. Vola, Sittard, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Oct. 18, 1976, Ser. No. 733,127

Claims priority, application Netherlands, Oct. 22, 1975, 7512356

Int. Cl.[2] B05B *5/02*

U.S. Cl. 118—658 **11 Claims**



1. In a magnetic roller comprising a rotatable cylinder of diamagnetic material and magnetic poles extending in axial direction inside said cylinder, each of said magnetic poles being formed by respective pole portions of like polarity of a plurality of magnets, which pole portions lie beside one another axially of the cylinder, the improvement which comprises at least one of said magnetic poles having disposed over and along said pole portions thereof between the same and said cylinder a length of material having high magnetic permeability, whereby a substantially homogeneous magnetic field is maintained over the length of the magnetic pole.

4,068,623

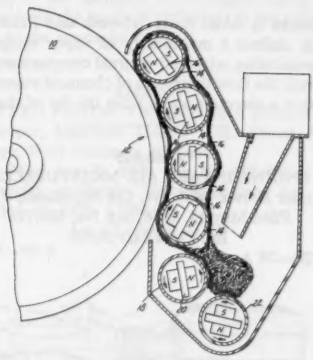
MAGNETIC FEED SYSTEM FOR DEVELOPER MIX

James F. O'Toole, Elmhurst, and Daryl F. Osberg, Hoffman Estates, both of Ill., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 709,963, July 30, 1976. This application Apr. 6, 1977, Ser. No. 784,967

Int. Cl.[2] B05B *5/02*; G03G *13/09*

U.S. Cl. 118—658 **3 Claims**



1. A sumpless magnetic brush apparatus for mixing and applying developing material to electrostatic images in an electrostatic printing machine of the type utilizing a moving photoreceptor surface, comprising at least one magnetic developing brush roller with an internal magnetic means for establishing a north and south pole on an axis extending in a generally normal direction to a tangent plane at the intersection of said axis and the surface being developed, said pole at the surface being inboard, and the opposite pole being outboard, said roller having a periphery upon which bristles of magnetic developing material are adapted to be formed;

a first mixer cylinder mounted adjacent to said brush roller with the axis thereof substantially parallel said brush roller, and with the surface thereof spaced from said brush roller a distance equal to the maximum depth of toner mix desired for said toner blanket;

magnetic means for establishing a north and south pole in the first mixer cylinder with the poles positioned to place the pole of the first mixer cylinder which lies outboard and the outboard pole of the brush roller in the same polarity to thereby create a flux pattern dividing the flux of the mixer cylinder to create a projecting pattern of the roller pole and mixer cylinder outboard and a blanket flow pattern to the inboard pole of the brush roller;

a second mixer cylinder mounted adjacent said first mixer cylinder, with means for establishing a north and south pole opposite to said first mixer cylinder with a flow flux pattern bridging the cylinders in a generally tangential direction; and

means to turn said developer brush roller in a direction to impel toner mix from the mixer cylinders along said surface being developed, and the mixer cylinders in the opposite direction.

4,068,624

REFILLABLE PERMANENT COLLAR FOR ANIMALS

Tiberius Ramney, Freehold Township, N.J., assignor to Bio-Pet Research Company, Wayne, N.J.

Filed May 21, 1976, Ser. No. 688,933

Int. Cl.[2] A01K *27/00*

U.S. Cl. 119—106 **5 Claims**

1. A refillable permanent collar for animals, comprising:

An elongated, flexible member having at the ends thereof a means for the securement of said ends about the neck of an

animal, said member defining therein a multiplicity of internal compartments integral therewith, said internal compartments defining openings for the removeable frictional securement therein of deodorant or other medicinal

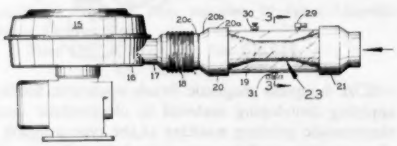
substances in tablet form, wherein said flexible member further defines a multiplicity of vapor escape channels communicating with said internal compartments in order to permit the flow therefrom of chemical vapors from said tablets in a direction away from the fur of the animal.

4,068,625

ENGINE INTAKE AIR MOISTURIZER

Charles Lester Brown, 8801 SW. 116 St., Miami, Fla. 33176

Filed May 12, 1976, Ser. No. 685,718
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 A **14 Claims**



1. A moisturizer for an engine carburetor comprising:
an open-ended housing for connection at one open end to the air intake of the carburetor, said housing having an air inlet opening at its opposite end;
an open-ended, annular body inside said housing defining a venturi passageway between its ends for conducting air from said air inlet opening of the housing to said air intake of the carburetor, said body having a reduced diameter throat at which air pressure in said body is at a minimum, and having tapered portions at both axial sides of said throat tapering outwardly therefrom, said body for at least a portion of its extent being spaced from said housing to define therewith a water chamber at the outside of said body, said body at said latter portion of its extent being porous to pass moisture from said water chamber for evaporation into the air flowing through said venturi passageway, said venturi passageway providing increased migration of water through said body at said throat due to the reduction of air pressure at said throat;
and means on said housing for introducing water into said chamber.

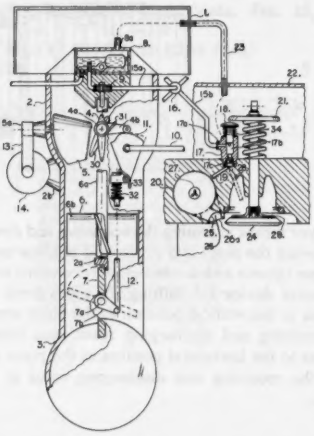
4,068,626

FUEL CONTROL OF INTERNAL COMBUSTION ENGINES

Willy A. Fiedler, 12758 Leander Drive, Los Altos Hills, Calif. 94022

Filed Dec. 5, 1975, Ser. No. 638,086
Int. Cl.[2] F02M *37/04, 69/00*
U.S. Cl. 123—30 D **10 Claims**

1. An arrangement for supplying fuel and air in dependence of operational and environmental conditions to an internal combustion engine, comprising in combination
an air duct for delivering air to said engine;
air control means, including
a throttle plate for controlling air flow in said air duct, means for controlling said throttle plate,
a plurality of vanes movably mounted in said air duct for generating air vortices,
means for controlling each of said vanes independently,
means for measuring air speed and vorticity in said air duct;
fuel flow control means, including
a floatbowl containing fuel under near-ambient pressure, means for metering fuel flow,
at least one fuel valve receiving said metered fuel flow, venting means between said fuel valve and said floatbowl for holding pressures within said fuel flow control means at near-ambient,



a manifold interconnecting said means for metering fuel flow and said fuel valve;
means for coupling said means for measuring air speed and vorticity with said means for metering fuel flow;
whereby said fuel flow control means are governed by said air control means, wherein said means for measuring air speed and vorticity are controlled by said throttle plate and said vanes in said dependence of operational and environmental conditions.

4,068,627

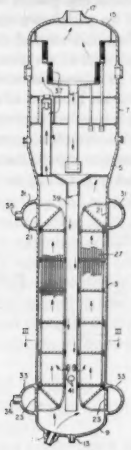
STEAM GENERATOR WITH VERTICAL TUBESHEETS

Hans D. Giesecke, Washington, D.C., and Sterling J. Weems, Chevy Chase Village, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1976, Ser. No. 646,813
Int. Cl.[2] F22B *1/06*; B22C *13/14*
U.S. Cl. 122—34 **10 Claims**

1. A heat exchanger for transferring heat from a primary fluid to a secondary fluid, said heat exchanger comprising:
a vertically oriented cylindrical sheel portion, said shell portion having an upper thickened cylindrical portion and a lower thickened cylindrical portion, said thickened portion having a plurality of holes so disposed to form upper and lower tubesheets integral with the shell and extending around the upper and lower portions thereof;
an upper head forming one end closure for said shell;
a lower head forming another end closure for said shell; and
a plurality of C-shaped tubes, the end of which are received by said holes to form the heat transfer surface of said heat exchanger, said tubes being disposed in wedge shaped bundles with a space between adjacent bundles and being

disposed to provide a central opening free of tubes extending throughout said bundles, thereby forming a heat ex-



changer with vertically oriented tubesheets to eliminate the buildup of crud adjacent the lower tubesheet.

4,068,628

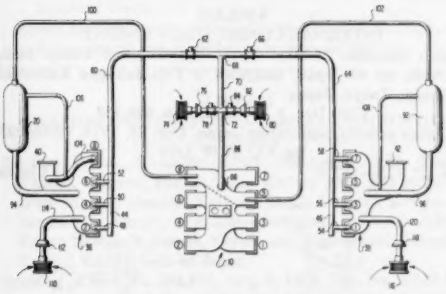
INTERNAL COMBUSTION ENGINE WITH DESIGNATED EXHAUST BURNING CYLINDERS

Charles England Duckworth, 1421 SE. 10th St., Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 654,750, Feb. 3, 1976, abandoned, and Ser. No. 579,736, May 21, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,835

Int. Cl.[2] F02B *75/20*; F02M *25/06*

U.S. Cl. 123—59 EC **14 Claims**



8. In a multi-cylinder, gasoline burning internal combustion engine of the type employing timed spark ignition, said engine including:

a. at least two cylinders selected to be designated exhaust burning cylinders, said selected cylinders having their pistons at the same relative positions and traveling in the same relative directions during all cycles of the operation of the engine, the remaining cylinders being gasoline burning cylinders,

b. an isolated intake manifold to supply a combustible mixture to said designated exhaust burning cylinders,

c. a common exhaust manifold system for both the gasoline burning and the designated exhaust burning cylinders, said common exhaust manifold system having a secondary exhaust manifold for drawing off a portion of the exhaust gases from the gasoline burning cylinders and also accumulator means for allowing expansion of the exhaust gases in the common exhaust manifold system to reduce the variations in pressure in the common exhaust manifold system, and

d. means for supplying the isolated intake manifold with a controlled mixture of fresh air and the exhaust gases drawn off by the secondary exhaust manifold for burning in the designated exhaust burning cylinders, whereby a more complete combustion of the fuel supplied to said engine is achieved thereby improving the efficiency and economy of the operation of the engine and at the same time reducing the levels of pollutants in the exhaust gases vented to the atmosphere.

4,068,629

STEPPED PISTON TWO STROKE ENGINES

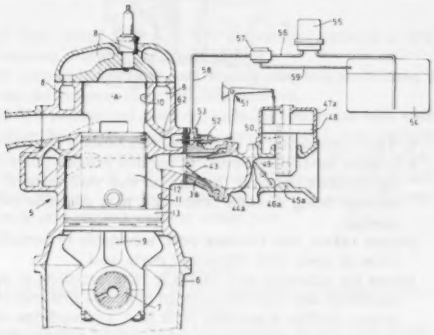
Bernard Hooper, Maybank House, Hope Street, Wordsley, Stourbridge, West Midlands, England

Filed Apr. 21, 1976, Ser. No. 678,935

Claims priority, application United Kingdom, Apr. 25, 1975, 17170/75; Dec. 31, 1975, 53386/75

Int. Cl.[2] F02B *75/02*

U.S. Cl. 123—65 S **6 Claims**



1. A two-stroke engine comprising a set of two cylinders each cylinder having a working part of smaller diameter and a pumping part of larger diameter; a piston slidably reciprocable in each cylinder and having a working part which slides in the working part of the cylinder and a pumping part which slides in the pumping part of the cylinder; and transfer passage means between the pumping part of each cylinder of the set and the working part of the other cylinder of the set so that at least the air for each charge required by the working part of each cylinder of the set is pumped, during operation of the engine, to such working part along transfer passage means from the pumping part of the other cylinder of the set, the piston motion within the cylinders of the set being such that the pistons are 180° out of phase, the improvement wherein:

I. the working part of each cylinder is provided with exhaust port means, main inlet ports and auxiliary inlet port means,

II. the main inlet ports are arranged symmetrically about, and spaced from, a plane which contains the longitudinal axis of the cylinder and which passes through the center of the exhaust port means,

III. the auxiliary inlet port means comprises at least one port in the cylinder wall opposite to the exhaust port means,

IV. the transfer passage means comprises main transfer passage means connected to the main inlet port means and auxiliary transfer passage means connected to the auxiliary inlet port means, and

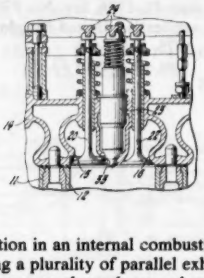
V. the exhaust port means of both cylinders of the set lies to one side of an axial plane containing the axes of the two cylinders of the set and the auxiliary inlet port means of both cylinders of the set and auxiliary transfer passage means of the set lies wholly on the other side of said axial plane; and

VI. means for supplying fuel to air which, when the engine is in use, passes through the auxiliary transfer passage means and the auxiliary inlet port means;
VII. means for sensing variations in the mass flow of air into the pumping parts of the cylinders of the set; and
VIII. means for metering the fuel supply in dependence on variations in said mass flow.

4,068,630
ENGINE WITH NOISE REDUCING EXHAUST VALVE ARRANGEMENT

David E. Bennett, Westland; Terrence S. Trasatti, Sterling Heights, and Lawrence D. Peterson, Detroit, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1975, Ser. No. 640,054
Int. Cl.[2] F02B 75/02
U.S. Cl. 123—75 C **4 Claims**



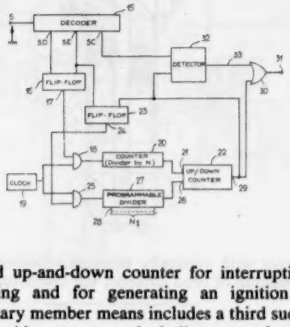
1. The combination in an internal combustion engine of
a cylinder having a plurality of parallel exhaust ports defining separate passages through an end wall thereof, each passage being directly connected to a common exhaust passage,
poppet valves, one for each port, actuatable to periodically close or open their respective ports, and
means for actuating said valves in timed relation to engine operation and operable to open at least a first one of said valves slightly in advance of at least a second one of said valves and to maintain said valves open simultaneously for the major portions of their open periods, said actuating means controlling the initial opening motion of said first valve to provide a predetermined limited time-area opening in advance of the opening of said second valve,
whereby exhaust flow is restricted during the initial opening period of said first valve, thus reducing the cylinder pressure by limiting exhaust gas flow in advance of the opening of said second valve and the wider opening of said first valve so that the exhaust blowdown pulse is controlled and exhaust noise is thereby limited.

4,068,631
INTERNAL COMBUSTION ENGINE ELECTRONIC IGNITION CONTROL SYSTEM

Claude Lombard, and Claude Leichle, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of France

Filed Apr. 9, 1976, Ser. No. 674,456
Claims priority, application France, Apr. 10, 1975, 75 11175
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 D **6 Claims**

1. an electronic ignition control system for an internal combustion engine comprising a rotary member means for revolving at the engine velocity, two successive reference marks positioned on said rotary member means, a sensor means disposed in close vicinity of said rotary member means for producing successively a first and second signal at the moment of passage of said two reference marks, a decoder means, means for connecting said sensor means to said decoder means, said decoder means provided for separating respectively on a first and second output, said first and second signal, an up-and-down counter, a first clock means for producing pulses which are gated for positive counting to said up-and-down counter during the time separating said first and second signals, a second clock means for producing pulses which are gated for negative counting to said up-and-down counter in response to said second signal, said first and second clock means having a common clock and said second clock means including a preselection counter operable as a programmable divider comprising programmation inputs, an ignition advance angle computing means for generating a number representative of a desired ignition advance law characteristics, means for applying said number to said programmation inputs, means for re-setting said up-and-down counter, and generating means responsive to the

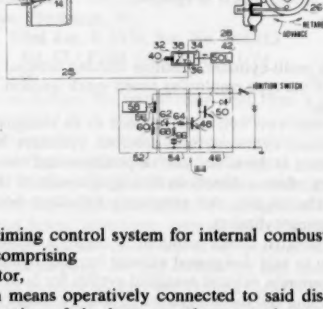


resetting of said up-and-down counter for interrupting said negative counting and for generating an ignition signal, wherein said rotary member means includes a third successive reference mark, said sensor means including means for producing a third signal at the moment of passage of said third reference mark, said decoder means including means for separating on a third output said third signal, said generating means for generating an ignition signal including an OR gate having a first input responsive to said resetting of said up-and-down counter and a second input which is operatively connected to the third output of said decoder so that said OR gate generates an ignition signal in case of failure of the signal applied to its first input.

4,068,632
INTERNAL COMBUSTION ENGINE

Yoshio Kanaida, Mitaka; Ryuji Katsuoka, and Kuniji Imai, Chofu, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,158
Claims priority, application Japan, Dec. 25, 1974, 49-504695
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 A **3 Claims**



1.
A spark timing control system for internal combustion engines, comprising
a distributor,
a vacuum means operatively connected to said distributor for actuation of the latter to advance and retard spark timing,
said vacuum means including an operative spark retard chamber,

a carburetor intake passageway,
a throttle valve closeably and openably mounted in said intake passageway defining a vacuum side and an atmospheric side, respectively,
conduit means connecting said intake passageway with said spark retard chamber of said vacuum means,
said conduit means communicating with said intake passageway at the vacuum side of said throttle valve when said throttle valve is closed in an idle position and communicating at the atmospheric side of said throttle valve when said throttle valve is partly opened,
valve means disposed in said conduit means intermediate said intake passageway and said spark retard chamber for selectively communicating said intake passageway with said spark retard chamber constituting a communicating condition and for venting said conduit means constituting a venting condition, respectively,
a solenoid means for operating said valve means in response to a predetermined signal to change said valve means over from said communicating condition to said venting condition,
switching means for supplying said predetermined signal to said solenoid means for said venting condition in response to a switching signal,
said switching means comprises a transistor circuit,
means for supplying said switching signal to said switching means comprising a comparator circuit and a delay circuit, the latter being connected operatively to said comparator circuit and to said transistor circuit,
said delay circuit comprises a diode and a first resistor connected to each other, the latter connected to an input of said transistor circuit, as well as a capacitor and a second resistor connected to each other in series, one end of said second resistor being connected at a point between said diode and said first resistor,
said comparator circuit includes a normally closed switch and a third resistor connected to each other at a junction, the latter being connected to a free side of a diode, as well as an engine speed sensor means for opening said normally closed switch when the engine speed exceeds said predetermined level,
means for supplying a potential to said transistor circuit, said delay circuit and to said comparator circuit.

4,068,633

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noriaki Kawai, Okazaki; Hisaji Okamoto, Aichi; Yosiaki Takeda, Nagoya; Fukuzi Sano, Kariya; Akio Kakiuchi, Nagoya; Masami Manabe, Kariya; Takashi Nomura, Kariya, and Sigeya Abe, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Kabushiki Kaisha, Kariya, both of Japan

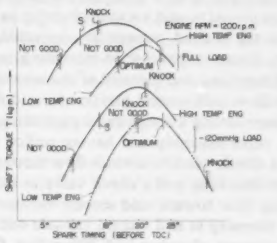
Division of Ser. No. 386,874, Aug. 9, 1973, Pat. No. 3,930,474, which is a continuation of Ser. No. 116,343, Feb. 18, 1971, abandoned. This application Nov. 25, 1975, Ser. No. 635,069

Claims priority, application Japan, Feb. 27, 1970, 45-17189; Mar. 30, 1970, 45-30471; Apr. 9, 1970, 45-34366; Apr. 9, 1970, 45-34367

Int. Cl.[2] F02P 5/04

U.S. Cl. 123—117 A **7 Claims**

1. An ignition system for an spark-ignition type internal combustion engine comprising an ignition device capable of performing the spark timing control function, and a temperature detecting element for detecting the temperature having an effect on the engine torque efficiency, whereby said ignition device is operated so that the spark timing under a low temperature condition is advanced as compared to that used under a high temperature condition according to the temperature detected by said temperature detecting element,
wherein said ignition device comprises a first vacuum spark advance mechanism having a first casing slidably secured to the housing of said ignition device and connected to said movable breaker plate, and
a second vacuum spark advance mechanism having a second casing secured to a housing of said ignition device,
said first and second casings being secured to said housing facing each other,
said first casing including a first diaphragm disposed therein,
said second casing including a second diaphragm disposed therein,



said first casing and said first diaphragm defining a first vacuum chamber therebetween,
said second casing and said second diaphragm defining a second vacuum chamber therebetween,
said first and second diaphragms being connected with each other by a connecting rod, whereby said first vacuum chamber is communicated with said first vacuum intake port by way of said temperature changeover valve, and said second vacuum chamber is directly communicated with said second vacuum intake port.

4,068,634

CONTROL SYSTEM FOR IGNITION TIMING OF ENGINE

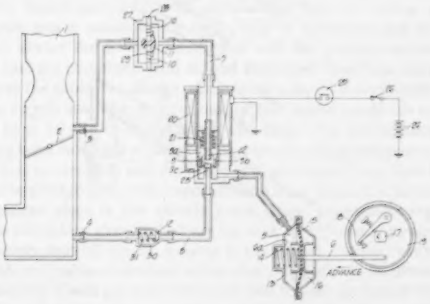
Minoru Tanaka, Chofu; Youji Ishii, Fujimi; Touru Yagi, Musashino, and Syoichi Otaka, Miyoshi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1975, Ser. No. 602,436

Claims priority, application Japan, Aug. 8, 1974, 49-94012

Int. Cl.[2] F02P 5/04

U.S. Cl. 123—117 A **3 Claims**



1. Ignition timing control apparatus for an internal combustion engine having, in combination: an intake passage and a throttle valve positioned in the intake passage, the intake passage having a first vacuum outlet located above the idle speed position of the throttle valve and subjected to vacuum intensity varying as a function of the degree of opening of the throttle valve from its idle speed position, the intake passage having a second vacuum outlet spaced substantially downstream from the throttle valve, the engine having a distributor including a movable ignition timing control member for varying the igni-

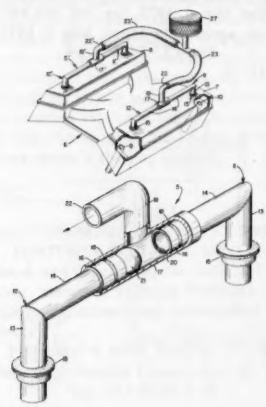
tion timing of the engine and having a vacuum chamber, the vacuum chamber being operatively connected to the ignition timing control member for advancing the ignition timing of the engine in accordance with increase in vacuum intensity in the vacuum chamber, a selector valve assembly communicating with said vacuum chamber, a first passage leading from said first vacuum outlet to said selector valve assembly, a second passage leading from said second vacuum outlet to said selector valve assembly, the selector valve assembly having an element movable from a first position in which said first passage is connected to said vacuum chamber to a second position in which the second passage is connected to said vacuum chamber, means responsive to increasing temperature of the engine for causing said element of the selector valve assembly to move from said second position to said first position, said first passage having a check valve permitting flow toward said selector valve assembly and having orifice means in parallel with said check valve to restrict flow through said passage in the other direction, and a check valve in said second passage permitting flow toward said second vacuum outlet when the vacuum intensity at said second vacuum outlet is greater than at said vacuum chamber and preventing flow toward said second vacuum outlet when the vacuum intensity at said second vacuum outlet is less than at said vacuum chamber, for keeping said vacuum chamber at relatively stable high vacuum intensity.

4,068,635

PRESSURE VENT

Henry Yunick, 1175 N. Halifax, Daytona Beach, Fla.

Filed June 8, 1976, Ser. No. 693,920
Int. Cl.² F01M *13/00*; F02M *7/00*
U.S. Cl. 123—119 B **8 Claims**



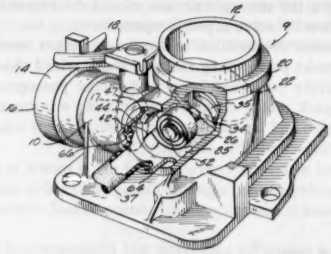
1. A pressure vent for an internal combustion engine comprising a conduit having ends connected to and communicating with end portions of a valve cover of an internal combustion engine, said conduit having spaced apart internally disposed valve seats, an outlet port between the valve seats, and a valve disposed in said conduit for movement between said valve seats and responsive to inertia and centrifugal forces for closing one or the other of said conduit ends during rapid acceleration, deceleration, or sharp cornering of a vehicle propelled by the engine.

4,068,636

THERMOSTATIC DEVICE FOR AUTOMATIC CHOKE CONTROL

Paul R. Nau, Wauwatosa; James L. Bartlett, Mequon, and Heinz K. Gund, Brookfield, all of Wis., assignors to Briggs & Stratton Corporation, Wawwatosa, Wis.

Filed Oct. 29, 1975, Ser. No. 626,928
Int. Cl.² F02M *1/10*
U.S. Cl. 123—119 B **10 Claims**



1. An internal combustion engine that has a crankcase, a carburetor comprising a body in which there is a mixing passage and a choke that has a rotatable shaft which projects through a wall of the mixing passage, a crankcase breather that permits gases to flow substantially freely out of the crankcase but restricts entry of air thereinto, and duct means communicating the crankcase breather with said mixing passage, said engine being characterized by:

A. a portion of said duct means comprising a chamber which is adjacent to the mixing passage and into which said shaft projects; and

B. a spirally coiled bimetal element in said chamber

1. having its inner end portion connected with said shaft,
2. having its outer end portion adapted to react against a portion of the wall of the chamber so that the bimetal element tends to position the choke valve in accordance with the temperature that prevails in said chamber, and
3. which is so arranged in said chamber that gases pass thereacross in flowing from the crankcase to the mixing passage, so that the temperature in said chamber always closely reflects the operating temperature of the engine.

4,068,637

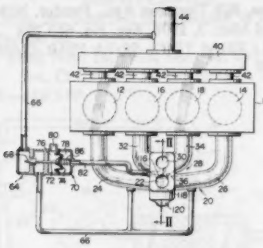
MULTICYLINDER INTERNAL COMBUSTION ENGINE

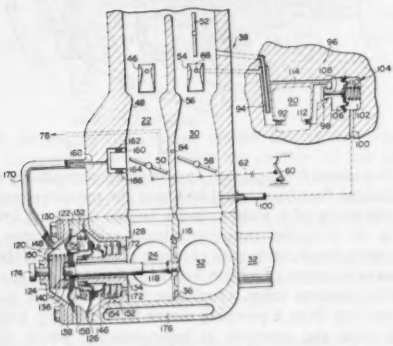
Bonnosuke Takamiya, Jyoyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Oct. 8, 1976, Ser. No. 731,013
Claims priority, application Japan, Oct. 24, 1975, 50-128720
Int. Cl.² F02M *25/06*; F01N *3/15*; F02B *75/10*
U.S. Cl. 123—119 A **6 Claims**

1. A multicylinder internal combustion engine comprising cylinders to which rich air-fuel mixture is supplied, cylinders to which lean air-fuel mixture is supplied, a rich mixture intake manifold supplying mixture from a rich mixture forming device to said rich mixture cylinders, a lean mixture intake manifold supplying mixture from a lean mixture forming device to said lean mixture cylinders, a manifold connecting port through which said two manifolds communicate with each other, an open-and-close valve installed in said connecting port, a pressure-responsive device that has a first and a second movable diaphragms vertically spaced in casing and comprises a first chamber defined by said first movable diaphragm and casing and a second chamber defined by said second movable diaphragm and casing, a rod that connects said first movable diaphragm to said open-and-close valve to actuate the valve, a mixed vacuum passage through which a mixture of vacuum in a first vacuum passage communicating with an intake passage upstream of a throttle valve in the perfectly closed position and vacuum in a second vacuum passage communicating with an

intake passage downstream of the throttle valve in the perfectly closed position, a third vacuum passage connecting said second chamber to at least either of said rich and lean mixture intake manifolds, a conduit connecting said first chamber to said mixed vacuum passage, a first spring that always urges said open-and-close valve toward the closing position, and a





second spring that always urges said open-and-close valve toward the opening position with greater force than said first spring.

2. A multicylinder internal combustion engine in accordance with claim 1, comprising an exhaust-gas recirculating passage that connects the engine exhaust system to at least either of said rich and lean mixture intake manifolds.

4,068,638

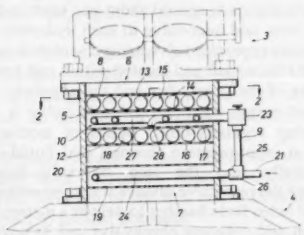
FUEL VAPORIZING METHOD AND APPARATUS

Farrell G. Butler, Jr., P.O. Box 763, Pearland, Tex. 77581

Filed July 16, 1975, Ser. No. 596,309

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 AA **5 Claims**



1. In an engine or the like employing a volatile liquid fuel and having carburetor means and internal combustion cylinder means, the improvement in combustion therewith comprising

housing means interconnected therewith and having an intake port for receiving fuel from the carburetor means and an outlet port for defining a flow path from the carburetor means to the combustion cylinder means,

a plate member positioned in said housing adjacent said intake port and laterally disposed across said flow path and having a plurality of apertures therein of a size increasing as a function of their relative lateral displacement from the axial center of said flow path,

support means spaced apart from said plate member and disposed laterally across said flow path in said housing,

a plurality of spherical members disposed in close proximity between said support means and said plate member,

tubular means having a first end connected to a source of heated air and extended along a circuitous path in close proximity to said said support means for supplying heat to said spherical members and having a second end disposed along the axial center of said flow path for discharging said heated air along said flow path toward said outlet port, and

adjustment means interposed in said tubular means for regulating said heat supplied to said spherical members.

4,068,639

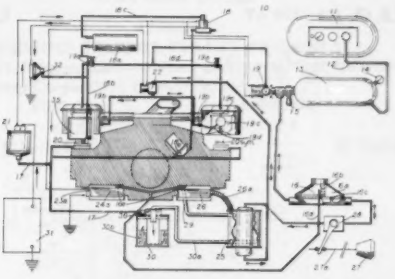
AUTOMOBILE ENGINE ECONOMIZER

Earl Charles Cook, 15 Hawthorne Way, Apt. 106, San Jose, Calif. 95110

Continuation-in-part of Ser. No. 559,322, March 17, 1975, abandoned, and Ser. No. 441,114, Feb. 11, 1974, abandoned. This application June 14, 1976, Ser. No. 696,078

Int. Cl.[2] F02M *13/06;* **F02B** *75/12*

U.S. Cl. 123—127 **5 Claims**



1. In an Automotive Engine Economizer for air-cooled and/or liquid-cooled internal combustion engines having a separate intake manifold for each bank of cylinders, and by which device the liquid primary fuel and the gaseous secondary fuel are combined with air and employed simultaneously to form the explosive charge, there being a liquid fuel carburetor to supply said charge by means of said intake manifolds to each bank of said cylinders, with said liquid fuel carburetors having been modified to require a percentage of gaseous secondary fuel to complete said explosive charge; an auxilliary liquid propane storage tank with vapor outlet means, located at some convenient place in the vehicle trunk space, communicating with a secondary gaseous fuel storage tank with pressure gauge and safety shut-off means, located in the engine compartment; a hand- and cable-controlled safety shut-off means to facilitate the employ of said gaseous secondary fuel by said air-cooled or liquid-cooled internal combustion engine or to shut down said economizer device or system when required; the combination of cut-off and pressure-regulator means for the gaseous secondary fuel communicating by line means with the modified air filters of said liquid fuel carburetors, said cut-off and pressure-regulator means being dependent upon and responsive to the engine temperature and intake manifold vacuum, there being no mechanical means for control of said gaseous secondary fuel by throttle members; a manifold-vacuum-operated master switch means to energize electrically said economizer device or system, and hot-air-damper-controlled micro-switch ground

means or a liquid-coolant sensor switch ground means to establish or interrupt the electrical circuit of said device or system; an exhaust manifold back-pressure-regulated pressure regulator valve in the gaseous secondary fuel supply means, and line means to communicate said exhaust manifold back-pressure to the control chamber of said gaseous secondary fuel pressure regulator valve; a micropressure regulator valve and solenoid valve means communicating with said modified air filters of said liquid primary fuel carburetors, means to supplement restricted liquid primary fuel when said air-cooled or liquid-cooled engine is idling; a distributor-advance-vacuum-operated micro-switch means to energize said solenoid valve; a combination vacuum tank and three-way solenoid valve means to control distributor advance mechanism to stabilize vacuum loses which may appear in the course of the operation of said device or system; a crankcase emission filter means to supply heat necessary to the proper conditioning of said gaseous secondary fuel, and line means to supply heated air from cooling-air dampers of air-cooled engine so equipped, or hose line and valve means to supply heated liquid medium from a liquid-cooled engine to said heat exchanger as needed; said economizer device or system being completely automatic once gaseous secondary fuel hand valve control is open and engine is started.

4,068,640

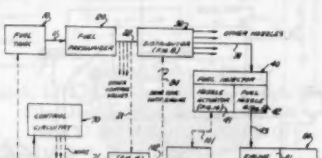
COMMON RAIL FUEL INJECTION SYSTEM

Edwin B. Watson, and Charles V. Brack, both of Sidney, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 411,605, Nov. 1, 1975, Pat. No. 3,990,422. This application May 19, 1976, Ser. No. 687,830

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AT **12 Claims**



1. A fuel system for an engine having a crankshaft and a combustion chamber, comprising:

means for continuously pressurizing fuel to a first predetermined pressure;

a fuel injector connected to said combustion chamber, said injector having an actuator and a nozzle which is opened when said actuator is in a first position and closed when said actuator is in a second position, said nozzle permitting fuel from the pressurizer to pass into said combustion chamber when said actuator is in said first position and pressurized fuel is present at said injector;

means for receiving and periodically distributing said pressurized fuel to said injector;

means for controlling the position of said actuator in timed relation to the rotation of said engine crankshaft, said control means including:

a flow control circuit which establishes a first rate of flow of pressurized fuel to said actuator to close said nozzle and which establishes a second different rate of flow of fuel from said actuator to open said nozzle, whereby the rate of opening and closing of said nozzle is controlled by said flow control circuit;

an electromagnetic control valve means connected between said means for pressurizing said fuel and said flow control circuit; and

electrical circuit means for operating said electromagnetic valve means to open and close said electromagnetic control valve means in timed relation to the rotation of said engine crankshaft, whereby fuel is periodically injected into said combustion chamber in timed relation to the rotation of said engine crankshaft.

4,068,641

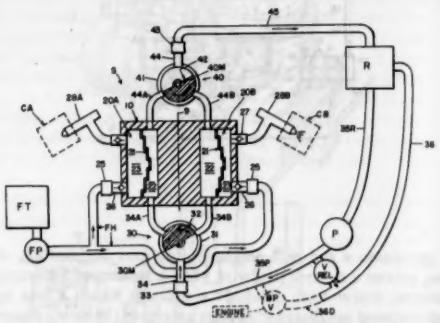
METERED FUEL INJECTION APPARATUS

Dennis L. Johnson, 509 Thurston Ave., Pender, Nebr. 68047

Filed Mar. 3, 1976, Ser. No. 663,254

Int. Cl.[2] F02M *37/12, 59/14;* **F04B** *43/06*

U.S. Cl. 123—139 A **8 Claims**



1. A metered fuel injection apparatus for sequentially injecting metered fuel from a fuel-tank into the respective combustion chambers of a multi-cylinder engine and each cylinder having its own fuel injection nozzle, said apparatus being removably connectable with elongate hoses respectively leading into a reservoir of motive hydraulic liquid stored at a finite reservoir-pressure value, a fuel-hose to said fuel-tank, and also a supply-line from a pumping means for delivering hydraulic liquid from the reservoir at input-pressure which exceeds reservoir-pressure, said apparatus comprising:

A. an upright housing surrounding an upright rotary shaft lying along a vertical-axis and comprising a plurality of compartments spaced at regular angular increments around said shaft, each compartment being equipped with a single upright fluid-impervious semi-rigid diaphragm-like barrier defining two subcompartments including firstly a fuel-chamber and secondly a single hydraulic-chamber extending continuously and without interruption both to a rotary inlet-valve and to a rotary outlet-valve, fuel-inlet means and incoming checkvalve communicating between the fuel-chambers and the fuel-hose, fuel-outlet means communicating from each fuel-chamber through an outgoing checkvalve to a said fuel injection nozzle, liquid-outlet means communicating from the respective hydraulic-chambers to said exhaust-hose, and liquid-inlet means regularly angularly spaced about said shaft and communicating from said inlet-valve to each hydraulic-chamber;

B. said rotary type inlet-valve being co-rotatational with said upright rotary shaft and located within said housing at the juncture of the supply-line and the angularly spaced liquid-inlet means whereby said inlet-valve is capable of delivering regularly-timed pulses of motive hydraulic liquid at input-pressure through said liquid-inlet means sequentially into the said hydraulic-chambers and whereby the respective divider-walls sequentially flex into the fuel laden fuel-chamber to deliver a metered fuel batch through said outgoing checkvalve and its nozzle; and

C. said rotary type outlet-valve being co-rotational with said upright rotary shaft and located within said housing in vertical alignment with but angularly lagging the inlet-valve, said lagging outlet-valve being at the liquid-outlet means thereby being capable of exhausting motive hydraulic liquid from said hydraulic-chamber at less than

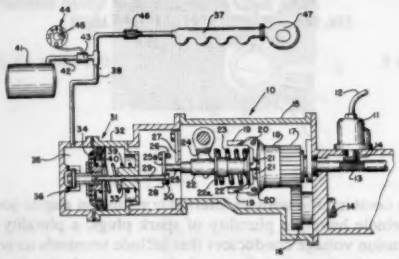
input-pressure along said liquid-outlet means into the reservoir after the divider-wall diaphragm has already delivered a fuel batch to the injection nozzle.

4,068,642

FUEL RATIO CONTROL WITH MANUALLY OPERATED AIR OVERRIDE

Joseph P. Little, Jr., Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 14, 1975, Ser. No. 631,964
Int. Cl.[2] F02M *39/02*; F02D *1/02*
U.S. Cl. 123—140 MP **8 Claims**



1. In an engine fuel-control system having fuel-limiting means for controlling and limiting the quantity of fuel delivered to the engine in response to a signal generated by pressure in a manifold by operation of the engine to an expansible chamber of said system, the improvement comprising means for overriding said fuel-limiting means comprising

pressure-responsive means connected to said fuel-limiting means and responsive to pressure variations in said expansible chamber for controlling actuation of said fuel-limiting means;

an auxiliary source of fluid pressure independent of pressure in said manifold; and

control means for adjustably directing pressurized fluid from said auxiliary source to said pressure-responsive means so that said pressure-responsive means acts in opposition to and overrides said fuel-limiting means, including adjustable valve means for selectively communicating pressurized fluid from said auxiliary source to said expansible chamber.

4,068,643

MULTIPLE SPARK IGNITION SYSTEM

Ian C. McKechnie, 252-27 E. Tropicana, Las Vegas, Nev. 89109

Filed May 28, 1976, Ser. No. 690,890
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CA **13 Claims**

1. A multiple spark ignition system comprising, in combination:

a crankshaft driven reluctor having a plurality of spaced arms extending radially outwardly from an axis,

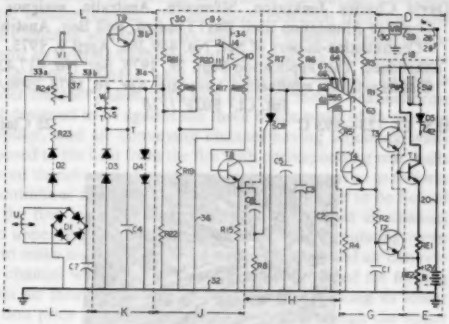
a first magnetic pickup coil having a core and a pair of terminals all mounted in magnetic association with said reluctor,

a unidirectional voltage divider the resistance of which decreases with increasing applied voltage connected across the terminals of said first coil with its divider point connected to ground potential,

a capacitor connected across one of said terminals of said first coil and ground, and

an amplifier having an input terminal connected to the other of said terminals of said first coil,

said amplifier producing an output pulse at a linearly earlier position of each arm of said reluctor in relationship to said core as operating speeds of an associated internal combustion engine increases so that an essentially fixed time interval exists from the time said amplifier produces an



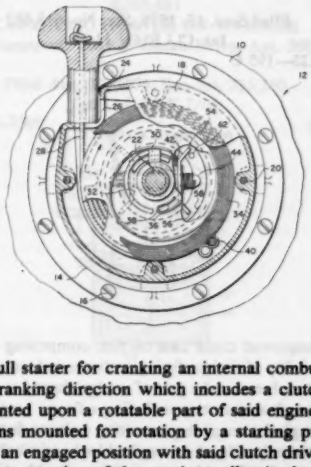
output pulse until each said reluctor arm reaches a constant position relative to said core.

4,068,644

REWIND STARTER PULLEY ASSEMBLY

Samuel O. Newport, Beloit, Wis., assignor to Colt Industries Operating Corporation, New York, N.Y.

Filed June 25, 1976, Ser. No. 699,994
Int. Cl.[2] F02N *3/02*; F16D *13/14*
U.S. Cl. 123—185 BA **10 Claims**



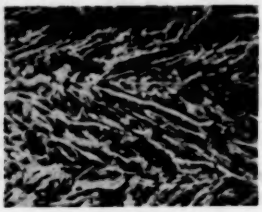
1. In a pull starter for cranking an internal combustion engine in a cranking direction which includes a clutch driven means mounted upon a rotatable part of said engine, driving clutch means mounted for rotation by a starting pulley and movable to an engaged position with said clutch driven means in response to rotation of the starting pulley in the cranking direction, a starting pulley assembly means comprising a spring retrieved starting pulley for rotating said driving clutch means, and clutch disengagement means mounted upon said starting pulley and positioned to engage said driving clutch means only if said driving clutch means is rotated in the cranking direction by said clutch driven means by the failure of said driving clutch means to disengage from said clutch driven means when said driving clutch means is no longer rotated by said starting pulley.

4,068,645

ALUMINUM-SILICON ALLOYS, CYLINDER BLOCKS AND BORES, AND METHOD OF MAKING SAME

David Charles Jenkinson, Sidmouth, Australia, assignor to Comalco Aluminium (Bell Bay) Limited, Bell Bay, Australia

Continuation-in-part of Ser. No. 459,261, April 9, 1975, abandoned. This application Sept. 29, 1975, Ser. No. 617,438
Claims priority, application Australia, Apr. 16, 1973, 2998/73
Int. Cl.[2] F02F 1/18
U.S. Cl. 123—193 C 23 Claims



1. An aluminum-silicon alloy suitable for wearing surfaces consisting essentially of aluminum and an amount of silicon which is in excess of 12.7% and up to 18%, said alloy having a microstructure which is free of primary aluminum and silicon phases and is composed of fibrous, fully modified particles of eutectic silicon having a particle size of less than 10 microns.

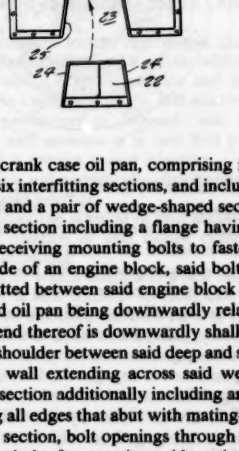
12. A cylinder block of an internal combustion engine, said cylinder block having a bore, said bore having as a wearing surface thereof the alloy of claim 1, said bore being fitted with a piston having an aluminum alloy working surface.

4,068,646

CRANK CASE OIL PAN

Joseph F. Hnojsky, 2249 S. 18th Ave., North Riverside, Ill. 60546

Filed Sept. 15, 1975, Ser. No. 613,482
Int. Cl.[2] F16N 31/00
U.S. Cl. 123—195 C 1 Claim



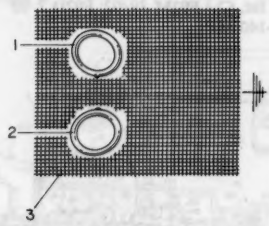
1. An improved crank case oil pan, comprising in combination, a plurality of six interfitting sections, and including an end section at each end and a pair of wedge-shaped sections therebetween, each said section including a flange having openings therethrough for receiving mounting bolts to fasten said sections to an underside of an engine block, said bolts extending through a gasket fitted between said engine block and said oil pan, one end of said oil pan being downwardly relatively deep while an opposite end thereof is downwardly shallow, a vertical wall forming a shoulder between said deep and said shallow ends, said vertical wall extending across said wedge-shaped sections, each said section additionally including an outwardly turned flange along all edges that abut with mating-like flanges of an adjacent said section, bolt openings through said flanges receiving mounting bolts for securing said sections together, and said sections each being independently removable from said engine block without need of removal of adjacent said sections.

4,068,647

AUTOMOTIVE IGNITION TOOL

Jerome R. Leddy, 322-16th St., Seal Beach, Calif. 90740

Filed Sept. 4, 1975, Ser. No. 610,111
Int. Cl.[2] F02B 77/00
U.S. Cl. 123—198 R 2 Claims



1. In combination with an internal combustion engine powered vehicle having a plurality of spark plugs, a plurality of high tension voltage conductors that include terminals secured to said spark plugs, and a grounded portion, a device for removing a desired one of said conductors from a spark plug by a user without said user receiving an electric shock, said device including:

a. a pliable metallic screen having first and second spaced openings therein in which a forefinger and thumb of said user may be inserted to deform said screen into contact with one of said terminals to permit said conductor of which it forms a part to be separated from a spark plug when said internal combustion engine is operating;

b. A pliable electrical conductor secured to said screen; and

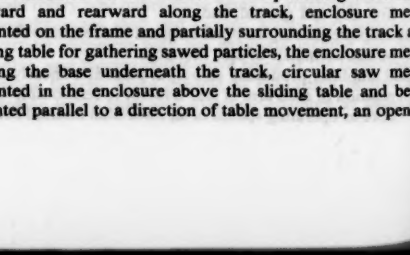
c. A metallic clip on a free end of said conductor that is secured to said grounded portion, with said high tension voltage conductor being removable from said plug when said engine is operating without said user receiving a shock due to said voltage flowing to said grounded portion rather to said user.

4,068,648

BRICK SAW APPARATUS

Peter M. Erdman, 320 Ainakea Way, Honolulu, Hawaii 96815

Filed Nov. 6, 1975, Ser. No. 629,393
Int. Cl.[2] B28D 1/04
U.S. Cl. 125—13 R 13 Claims



1. Brick saw apparatus comprising a frame having a base, track means mounted on the base of the frame for limiting movement of a device moving on the track, slidable table means mounted on the track for reciprocating movement forward and rearward along the track, enclosure means mounted on the frame and partially surrounding the track and sliding table for gathering sawed particles, the enclosure means having the base underneath the track, circular saw means mounted in the enclosure above the sliding table and being oriented parallel to a direction of table movement, an opening

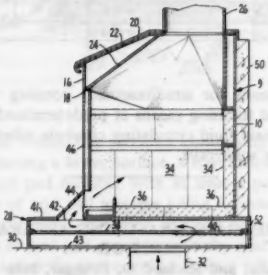
means in the base at a distal end of the enclosure means for receiving sawed particles from the enclosure means, and a pit means connected to the enclosure means beneath the base in communication with the opening means for receiving sawed particles from the opening means and the table having a flexible wiper means mounted on a distal end of the sliding table means and extending downward from the sliding table means to the base of the enclosure for wiping sawed particles rearward toward the opening means.

4,068,649

FREE STANDING FIREPLACE STOVE

William R. Johnson, Santa Cruz, Calif., assignor to Peerless Portable Metal Building, Santa Cruz, Calif.

Filed May 12, 1976, Ser. No. 685,453
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **5 Claims**



1. A free standing fireplace stove having a front and a back with a mouth in the front for supplying fuel to the stove, and having in combination:

a. a base for said fireplace stove, said base extending forward beyond the mouth of said fireplace and having an open passage for air therein;

b. an outlet for combustion air leading from said passage in said base to the front of said fireplace said passage extending completely across the mouth; and

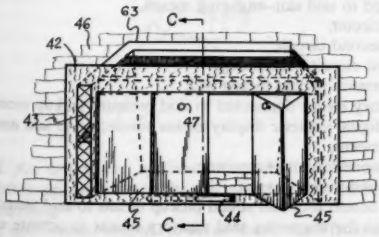
c. an air inlet adjacent the rear of said base whereby combustion air for said fireplace enters the rear of the base, passes completely under the fireplace, the enters the fireplace stove as combustion air through said outlet.

4,068,650

FIREPLACE HEATING CHANNEL

Clifford H. Nelson, 9 Merry Point Terrace, Newport News, Va. 23606

Continuation-in-part of Ser. No. 641,725, Dec. 18, 1975, Pat. No. 3,995,611. This application Aug. 23, 1976, Ser. No. 716,595
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.
Int. Cl.[2] F24B *7/04*
U.S. Cl. 126—121 **6 Claims**



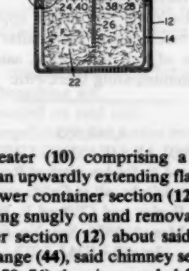
1. A free standing fireplace heating channel comprised of a three sided hollow metal room air conveying channel equipped with an internal baffle to direct the flow of air, an internally mounted blower for forcing circulation of room air, a thermostatic blower control, a flame guide radiation reflector vane and vertically adjustable legs, the entire assembly being insertible in an existing fireplace without requiring modification to the structure thereof, said air conveying channel having a center channel joined with two forward facing channel arms and designed to fit against the three inside walls of an existing fireplace, said air conveying channel having adjoining walls exposed to the heat from the fire with corresponding rear walls spaced therefrom and connected by spacer means so as to form a continuous air channel for conveying room air to be heated by the fire, including baffle means, dividing said air channel into upper and lower portions, to direct the circulating room air to make multiple horizontal passes through said air conveying channel wherein air blower means is provided for forcing room air through said air conveying channel along its lower portion prior to existing back into a room through the upper portion thereof as useful heated air, a thermostatic blower control located inside one of said channel arms and mounted on the air channel wall exposed to the fire, said flame guide radiation reflector vane being symmetrically attached to the upper inside surfaces of said forward facing channel arms and having an approximately V-shaped crossection with a vertical surface located under an existing fireplace arch and provided with a small top horizontal flange and an adjoining bottom surface slanting upward and rearward being positioned forward of the center air channel to provide suitable exit for the fire exhaust gases to the chimney, said bottom surface of said flame guide radiation reflector vane having a top covering of heat insulation preventing major loss of heat energy to an existing chimney, said vertically adjustable legs attached to the bottom of said air conveying channel providing means of moving the whole assembly upward to place said small top horizontal flange of the flame guide radiation reflector vane in direct contact with an existing fireplace arch during installation of the fireplace heating channel.

4,068,651

CATALYTIC HEATER OR WARMER

Alfred A. Rappaport, 2081 S. Ocean Drive, Apt. 305, Hallandale, Fla.

Filed Aug. 20, 1976, Ser. No. 716,260
Int. Cl.[2] A61F *7/06*
U.S. Cl. 126—208 **16 Claims**



1. A catalytic heater (10) comprising a lower container section (12) having an upwardly extending flange (44) adjacent to the top of said lower container section (12), an upper chimney section (46) fitting snugly on and removably supported on said lower container section (12) about said lower container section extending flange (44), said chimney section (46) having air draft means (50, 52, 54) therein, a sealed fuel cartridge (14) having a fuel absorbent material (22) therewithin having a premeasured amount of liquid fuel absorbed therein, and a wick (26) in said fuel absorbent material (22) extending up from said material (22), said sealed fuel cartridge (14) having a readily removable cover (16) secured thereon, said cartridge fitting within said lower container section (12), a catalyst con-

taining member (28) supported over said fuel absorbent material (22) and having aperture means (40) through which said wick (26) is extended, a wick snuffer (64) depending from a frame (62) mounted above said fuel cartridge (14) insertable through a top opening in the roof (68) of said chimney section (46), said chimney section having fuel combustion vapor emitting openings (66) therein.

4,068,652

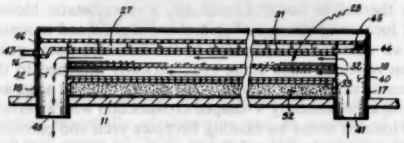
MULTI-PURPOSE SOLAR COLLECTOR/HEAT EXCHANGER

Mark N. Worthington, 10227 White Mountain Road, Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 519,521, Oct. 31, 1974, Pat. No. 3,957,109. This application Feb. 17, 1976, Ser. No. 658,475

Int. Cl.² F24J 3/02

U.S. Cl. 126—270 **10 Claims**



1. In a multi-purpose solar collector-heat exchanger intended for installation in a building in a position having a vertical component,

a. a multiple tier unit providing a plurality of longitudinal channels in parallel relation and comprising three flat metallic sheets arranged in spaced relation with two longitudinally grooved sheets each of which is interposed between a pair of adjacent flat sheets and secured thereto, said flat and grooved sheets cooperating to define two tiers of longitudinal channels,

b. a manifold at each end of said channels communicating with all of said channels,

c. a duct extending from and communicating with each of said manifolds, one of said ducts constituting an air inlet and the other duct an air outlet,

d. a frame comprising bottom, side and end walls providing an open top, and enclosing said flat and grooved sheets and said manifolds,

e. a transparent heat trap supported by said frame in spaced relation with respect to the uppermost of said flat sheets,

f. a perforated pipe extending across the upper end of the uppermost of said flat sheets and communicating with a source of liquid under pressure and of a desired temperature whereby jets of said liquid are delivered onto the upper end of the uppermost of said flat sheets to form a film of liquid thereon, and

g. a trough at the lower end of the uppermost of said flat sheets which receives said liquid after it has passed over the uppermost of said flat sheets, said trough having a drain pipe communicating therewith.

4,068,653

SOLAR HEATING UNIT

Leo Bourdon; Richard K. Burley, both of Reseda, and Clifford F. Kennedy, Thousand Oaks, all of Calif., assignors to Leo Bourdon; Richard K. Burley and Clifford F. Kennedy

Filed Mar. 1, 1976, Ser. No. 662,679

Int. Cl.² F24J 3/02

U.S. Cl. 126—271 **12 Claims**

1. Apparatus for collecting heat produced by solar energy comprising:

a base;

a pair of legs attached to said base;

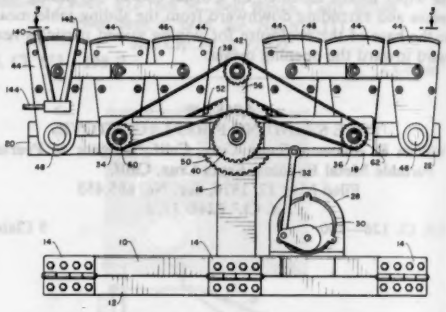
a substantially rectangular carriage;

axle means rotatably supporting said carriage on said legs;

a plurality of panels rotatably supported by said carriage;

a plurality of fluid circulating conduits supported by said panels;

focusing means for focusing the solar rays on said conduits;



rotatable means for simultaneously rotating the carriage panels and focusing means at predetermined intervals to maintain said fluid circulating conduits substantially normal to the solar rays.

4,068,654

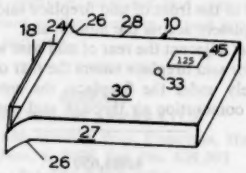
BLOOD PRESSURE MEASURING APPARATUS AND METHOD

Oiva A. Paavola, and Richard D. Brugger, both of Erie, Pa., assignors to Oiva A. Paavola, Erie, Pa.

Continuation-in-part of Ser. No. 551,071, Feb. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 344,752, March 26, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,178

Int. Cl.² A61B 5/02

U.S. Cl. 128—2.05 N **5 Claims**



1. An instrument for evaluating the circulatory system of an animal by sensing externally applied pressure and by sensing Korotkoff sounds at the systolic and diastolic points comprising,

a body having finger-engaging means thereon,

a detector head supported on said body,

said detector head having skin-engaging means thereon,

a pressure pickup means and a sound-pickup means connected to said skin-engaging means,

a first circuit,

and a second circuit,

said first circuit comprising,

said pressure pickup means and,

a memory means connected to said pressure pickup means,

and a digital numeric display means connected to said memory means,

said second circuit comprising,

said sound pickup means,

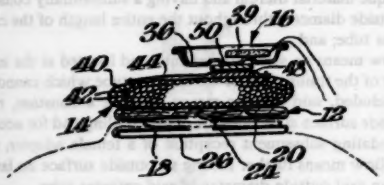
means connecting said sound pickup means to said memory means for triggering said memory means to actuate said numeric display means whereby said numeric display means indicates proportional to the pressure exerted on

said pressure pickup means at the occurance of each said sound by said pickup.

4,068,655
SURGICAL RETRACTOR AND SPONGE CARRYING ASSEMBLY

Pierre L. LeRoy, Wilmington, Del., assignor to New Research and Development Lab., Inc., Wilmington, Del.

Filed Aug. 2, 1976, Ser. No. 710,735
Int. Cl.[2] A61B *17/02*
U.S. Cl. 128—20 16 Claims

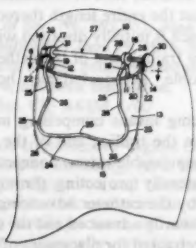


1. A surgical wound flap retractor comprising an absorbent pad member having a lower surface, a cover member partially enveloping said pad member with at least a portion of said lower surface of said pad member being exposed, said cover member including end extension sections extending beyond opposite ends of said pad member whereby said pad member may be placed directly above and in contact with an inverted wound flap with said exposed lower surface in contact therewith and said extension sections may be tucked under the wound flap to at least partially encircle the wound flap, said cover member being made of a flexible extensible non-conductive material which is capable of being heat sterilized, securing means on said pad member and cover member for maintaining said pad member in place with respect to said cover member and for permitting said device to be affixed to surgical drapery or the like, and said securing means including aligned apertures extending through said cover member and said pad member whereby fasteners may be inserted through said aligned apertures.

4,068,656
ORTHOPEDIC TOENAIL DEVICE

Barbara Ann Barmore, Rte. 17, Dewittville, N.Y. 14757

Filed Sept. 30, 1976, Ser. No. 728,277
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—81 A 4 Claims



1. An orthopedic appliance for relieving the pain of an ingrown nail and placing the nail in proper position for growth comprising:

a. insert means adapted to act on the forward front underside edges of the nail and free from contact with the top side edges of the nail;

b. resilient means adapted to act on the upper rear surface of the nail;

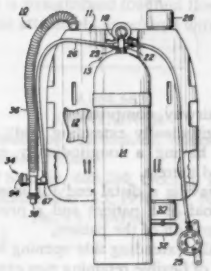
c. said insert means and resilient means being integral and in fixed angular relation with one another;

c. an adjustment member coacting between said insert means and said resilient means and adapted to separate said insert means against the side edges of the nail tending to load the resilient means and move the nail side edges upward and outward to relieve the pressure of the nail and place the nail in proper position for growth.

4,068,657
CONSTANT VOLUME BUOYANCY COMPENSATION SYSTEM

John Kobzan, Glenview, Ill., assignor to Dacor Corporation, Northfield, Ill.

Filed June 28, 1976, Ser. No. 700,581
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—142 R 9 Claims



1. An underwater buoyancy compensation control system for use by a diver having a source of breathing air under pressure, comprising

a buoyancy tank adapted to be attached to said diver,

said tank having a constant volume chamber therein sealed from the ambient,

a first manually operable valve connected to the bottom of said chamber for controlling the flow of ambient water into and out of said chamber,

first pressure regulator valve means connected between said chamber and the ambient,

said first pressure regulator valve means being responsive to the pressure differential between said chamber and the ambient for automatically connecting said chamber to the ambient when the chamber pressure exceeds ambient pressure by at least a predetermined amount,

a hand-held manually controlled unit for enabling the diver to adjust the buoyancy compensation of said system,

a first flexible conduit connected between said unit and said chamber,

a second flexible conduit connected between said unit and said source of breathing air,

a mouthpiece mounted on said unit,

second pressure regulator valve means mounted in said unit for automatically connecting said first conduit to said second conduit when the ambient pressure exceeds the pressure in said chamber by at least a predetermined amount,

said second pressure regulator valve means having an inlet connected to said second conduit and an outlet connected to said first conduit,

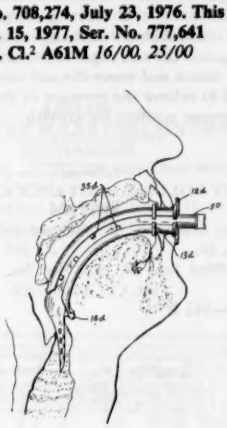
manually operable means mounted on said unit for operating said second pressure regulator valve means to connect said first conduit to said second conduit, and

a second manually operable valve means mounted in said unit for connecting said mouthpiece with said outlet of said second pressure regulator valve means.

4,068,658
INTUBATING PHARYNGEAL AIRWAY

Robert A. Berman, 501 Cedar Hill Road, Far Rockaway, N.Y. 11691

Division of Ser. No. 708,274, July 23, 1976. This application Mar. 15, 1977, Ser. No. 777,641
Int. Cl.[2] A61M *16/00, 25/00*
U.S. Cl. 128—208 1 Claim

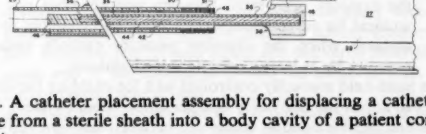


1. An intubating airway, comprising:
a. A tubular longitudinally extending body member, said body member having a longitudinally extending side opening, defined therein,
b. said member having a distal end for insertion into the mouth and throat of a patient and a proximal end for location at the mouth of the patient,
c. said longitudinally extending side opening being provided with a plurality of flexible retaining pins extending therein in staggered relationship, whereby an endotracheal tube may be passed laterally through said longitudinally extending side opening and is retained in position within said airway by said retaining pins.

4,068,659
CATHETER PLACEMENT ASSEMBLY

Harvey Robert Moorehead, Salt Lake City, Utah, assignor to Deseret Pharmaceutical Co., Inc., Sandy, Utah

Filed July 12, 1976, Ser. No. 704,715
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214.4 18 Claims

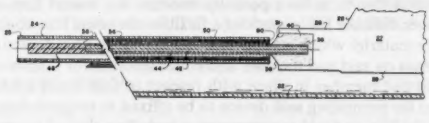


1. A catheter placement assembly for displacing a catheter tube from a sterile sheath into a body cavity of a patient comprising:
a cannulated disposable needle having a sharpened leading end;
a substantially linear semi-rigid shape-retaining disposable sheath having an axial slit therein;
disposable hollow means connecting the trailing end of the needle to the leading end of the sheath whereby the needle, sheath and hollow means are joined together and discarded essentially simultaneously after use;
a flexible plastic catheter tube of substantially constant diameter throughout the entire length thereof at least the trailing end of which is initially disposed within the hollow of the sheath;
catheter advancing means comprising means abutting but separate from the trailing end of the catheter tube and manually manipulatable means connected to the abutting means and laterally projecting through said slit in the sheath whereby the catheter advancing means and the catheter tube are unitarily advanced and the catheter advancing means alone retracted for placement of the leading part of the catheter tube into the body cavity through the hollow of the needle following puncture, the catheter tube eventually becoming completely separated from the sheath and needle and the remainder of the assembly excluding the catheter tube being essentially unitarily discarded after said complete separation and while retaining the catheter tube within the body cavity.
14. A catheter comprising:
a highly pliant elongated catheter tube the leading part of which is to be placed and left indwelling within the vein of a patient, the tube comprising silicone rubber and a radiopaque material therein and having a substantially constant outside diameter throughout the entire length of the catheter tube; and
hollow means on said catheter tube and located at the interior of the trailing end of the catheter tube which cannot be occluded, said interior means defining a constant, rigid inside surface at the interior of said trailing end for accommodating subsequent reception of a female adapter, said hollow means further having an outside surface no larger than said outside diameter of said catheter tube.

4,068,660
CATHETER PLACEMENT ASSEMBLY IMPROVEMENT

Richard William Beck, Sandy, Utah, assignor to Deseret Pharmaceutical Co., Inc., Sandy, Vt.

Filed July 12, 1976, Ser. No. 704,716
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214.4 10 Claims

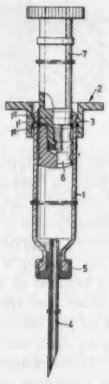


1. A catheter placement assembly for displacing a catheter tube from a sterile sheath into a body cavity of a patient comprising:
a cannulated disposable needle having a sharpened leading end;
a substantially linear hollow semi-rigid shape-retaining disposable sheath having an axial slit therein;
disposable hollow means connecting the trailing end of the needle to the leading end of the sheath whereby the needle, sheath and hollow means are joined together and discarded essentially simultaneously after use;
a flexible plastic catheter tube of substantially constant diameter throughout the entire length thereof at least the trailing end of which is initially disposed within the hollow of the sheath, the trailing end of the catheter tube including laterally flexible anti-occludable hollow reinforcing means;
catheter advancing means comprising means abutting but separable from the trailing end of the catheter tube and manually manipulatable means connected to the abutting means and laterally projecting through said slit in the sheath whereby the catheter advancing means and catheter tube are unitarily advanced and the catheter advancing means alone retracted for placement of the leading part of the catheter tube into the body cavity through the hollow of the needle following puncture, the catheter tube eventually becoming completely separated from the sheath and needle and the remainder of the assembly excluding the catheter tube being essentially unitarily discarded after said complete separation and while retaining the catheter tube within the body cavity.

4,068,661
INJECTION SYRINGE WITH SEPARATE ONE-PIECE FINGER REST

Werner Hennings, Bunde, Germany, assignor to Bunder Glas GmbH, Germany

Filed Feb. 9, 1976, Ser. No. 656,461
Claims priority, application Germany, Feb. 12, 1975, 7504229[U]
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—215 5 Claims



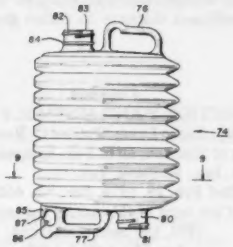
1. An injection syringe comprising:
a. a cylindrical barrel having a forward end forming a head and an open rear end;
b. the barrel having a finger rest region in the vicinity of its open rear end with at least one annular groove;
c. a cannula held by the head;
d. a plunger closing the open rear end of the barrel;
e. a ram for slidably displacing the plunger inside the barrel;
f. an initially separate, one-piece finger rest having a mating surface that is correspondingly shaped with respect to the shape of said finger rest region and includes at least one ridge which is complementary to the groove in the barrel;
g. the finger rest being slidingly fitted to the barrel with the ridge on the finger rest being effective to engage the groove in the barrel and secure the finger rest in place; and
h. an annular thickening ridge is located on each side of said groove in the barrel to create a snap action effect when the separate finger rest is fitted to the barrel.

4,068,662
ACCORDION-STYLE SYRINGES, DOUCHES AND ATTACHMENTS THEREFOR

Vincent R. Sneider, 3422 Hallcrest Drive, NE., Atlanta, Ga. 30319

Continuation-in-part of Ser. No. 592,037, June 30, 1975, Pat. No. 4,014,332. This application June 29, 1976, Ser. No. 700,838
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—232 9 Claims

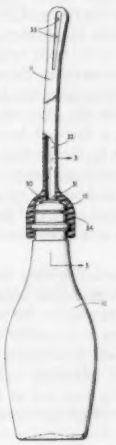
1. An accordion-style container for vaginal douches, enemas and the like, said container including: (a) a flexible side wall having an accordion configuration and terminating with end member portions and with each end portion of the container having finger gripping handle portions, and with the discharge end of the container additionally provided with retaining means for a fluid conduit; (b) a manipulative shutoff valve associated with said discharge conduit, said valve when open permitting the flow of fluid from the container, said conduit being semiflexible and having at least one stiffening rib locally formed as a part of the outer surface of the conduit and providing an assist to insure bending of the conduit into a pinch configuration to provide fluid-flow cutoff when the conduit is bent substantially at a right angle to and away from the stiffening rib whereby in this bent condition the sides of the conduit are brought together to inhibit flow therethrough; (c) a depending portion formed on the lower end portion of the container and having an aperture adapted for releasably retaining this conduit in the bent condition during storage and shipment until the conduit is straightened for fluid flow and use, and (d) a discharge nozzle attachably associated with the outlet end of the conduit.



4,068,663
CONTAINER

Alfred C. D'Alessandro, Marblehead, Mass., assignor to Aid Pak, Inc., Stoneham, Mass.

Continuation of Ser. No. 408,299, Oct. 23, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,330
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—232 11 Claims



1. In combination, a Fluid containing plastic squeeze bottle having an integrally formed cover, a nozzle attachment having an integrally formed means for removably interlocking said nozzle to said cover, said cover having a dome with an opening formed therein by twisting off an integral twist off member along an annularly shaped thin section in said dome, said dome comprising a cantilever section and an integral annular depending skirt about its outer periphery, said opening being formed in the center of said cantilever section and defined solely by the thickness of said thin section, said skirt having a thickness greater than the thickness of said cantilever section whereby said cantilever section may be deflected in the direction of the axis of said skirt, said nozzle attachment having means defining a downwardly depending internal annular ring engaging said cantilever section in a fluid tight seal about the

periphery of said opening and a passage extending through the nozzle attachment terminating at one end in a plurality of portals and at the other end in an opening with the annular ring disposed adjacent to and concentric with the opening in the nozzle attachment, the openings in the nozzle attachment and dome being of comparable size and the cantilever section extending a sufficient distance to define the opening in the dome.

4,068,664

SURGICAL SUCTION WAND ASSEMBLY AND METHOD

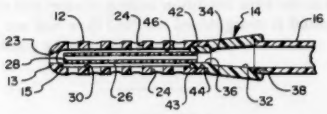
Russell G. Sharp, Sugar Land; Charles C. Reed, and Denton A. Cooley, both of Houston, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Feb. 25, 1976, Ser. No. 661,224

The portion of the term of this patent subsequent to June 15, 1993, has been disclaimed.

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—276 **2 Claims**



1. A surgical suction wand and tip assembly comprising in combination:

an elongated suction tip comprising a body having a smoothly contoured exterior and an internal cavity which cavity is polygonal in cross-section, each face of the polygon defining an essentially flat interior surface within the tip;

an array of apertures in the body of the suction tip intersecting the longitudinal axis of the internal cavity and communicating the exterior of the body with the internal cavity at one of each of the flat surfaces of the polygon, the array in one surface being displaced along the axis of the tip with respect to the array in the adjacent surface;

an adaptor comprising a through-bore, a first coupling for securing the adaptor to the suction tip, a forwardly projecting hollow tube mounted concentric with the through-bore of the adaptor, said hollow tube projecting telescopically within the internal cavity of the suction tip, a second coupling differing in size from the first on the rear of the adaptor;

a wand assembly and means joining the adaptor to the wand assembly, said wand assembly comprising an essentially rigid hollow tube mounted to the second coupling of the adaptor and extending rearwardly therefrom;

a weighted handle of metal construction, the handle comprising a single axial, generally cylindrical through-bore opening at the leading end and at the trailing end of the handle, the leading end of the through-bore tapering outwardly;

an elongated conduit comprising a unitary, generally cylindrical insert having an external configuration which corresponds to the through-bore within the handle, the insert tapering outwardly at its leading end and joined at its leading end to the hollow tube mounted to the second coupling of the adaptor;

the external surface of the insert defining a diameter which is essentially the same as the diameter of the through-bore, said insert being telescopically surmounted by the handle and releasably attached thereto with a press-fit coupling, the through-bore receiving the insert in snug relationship along the entire length of the bore; and

a coupling for flexible suction tubing integral and coextensive with the trailing end of the insert, said coupling projecting beyond the trailing end of the handle when the handle surmounts the insert.

4,068,665

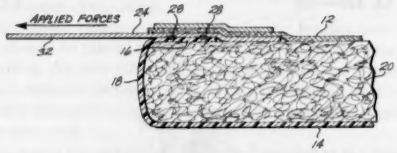
DISPOSABLE DIAPER WITH IMPROVED TAPE FASTENER

Lawrence E. Nelson, Vader, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 6, 1976, Ser. No. 747,589

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **2 Claims**



1. In an absorbent article of the type having a fluid-permeable body contacting top sheet, a fluid-impermeable plastic film backing sheet, and an absorbent filler disposed therebetween together with a tape fastener system along at least one edge of the article, the improvement comprising:

at least one fastening tape having a fixed portion with one surface thereof being bonded to a portion of the bottom surface of the top sheet and the other surface thereof bonded to a portion of the backing sheet and an attachment portion having an open and closed position, and in which said portion of the backing sheet to which the fixed portion is bonded is a narrow marginal portion thereof which extends inwardly from the article edge after having extended around said edge and in a plane substantially coplaner with the top sheet and

said fastening tape, when in the open position, serving to transmit a substantial amount of the forces applied thereto through the bonded area between the fixed portion and a portion of the bottom surface of the top sheet to the top sheet.

4,068,666

SURGICAL SPONGE AND METHOD OF FORMING THE SAME

James A. Shiff, Encino, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed May 16, 1975, Ser. No. 578,355

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—290 W **14 Claims**

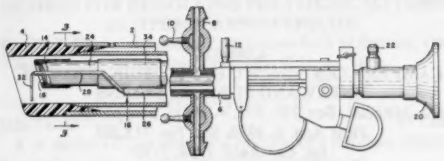
1. A surgical sponge or dressing comprising an absorbent planar core layer interposed between a pair of porous and substantially non-linting outer layers, said outer layers having reverted peripheral edge portions extending about the entire perimeter of said sponge, said reverted edge portions of the respective outer layers being in continguous relation with each other and being disposed only on one side of said core layer, said core layer having a reverted peripheral portion received within the fold of the reverted peripheral edge portion of one of said outer layers, and means directly securing the reverted edge portion of said outer layers and the reverted peripheral portion of said core layer together, said core layer having substantial surface portions thereof unsecured to said outer layers.

4,068,667

ANTI-ARCING RESECTOSCOPE

Jose J. Iglesias, 1341 North Ave., Elizabeth, N.J. 07200

Filed Sept. 3, 1976, Ser. No. 720,424
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—303.15 2 Claims



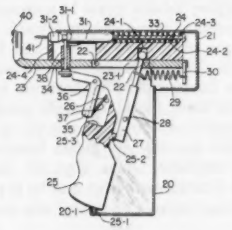
1. A resectoscope comprising an elongated tubular sheath having a distal end, an elongated tubular telescope within and extending longitudinally of the sheath and having a distal end adjacent the distal end of the sheath, a tube extending longitudinally of the sheath and the telescope and having a distal end adjacent the distal end of the telescope and at least partially surrounding and engaging the telescope to support and stabilize it, and a cutting loop assembly mounted within the sheath for longitudinal reciprocation with respect to the telescope and the tube and having a depending bare wire loop disposed distally to the distal end of the telescope and the distal end of the tube and adapted to be charged with electricity, means for reciprocating the cutting loop assembly, the distal end of the tube extending beyond the distal end of the telescope and having its peripheral surface completely coated at and adjacent to its distal end with a material which is non-conductive to electricity, resistant to high temperatures and chemicals used in transurethral procedures, and provides an anti-friction surface on the surface of the tube on which it is coated.

4,068,668

EAR LOBE PIERCING DEVICE

Larry D. Moore, Attleboro, Mass.; Isaiah W. Johnson, Greensboro, and Charley L. Thompson, Jr., McLeansville, both of N.C., assignors to Concept Marketing, Inc., Attleboro, Mass.

Filed Sept. 8, 1975, Ser. No. 611,449
Int. Cl.[2] A61B *17/00*; F41B *7/00*; F41C *19/00*
U.S. Cl. 128—330 11 Claims



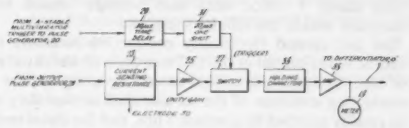
1. An ear lobe piercing device comprising support means, clamping means supported by said support means adapted to clamp an ear lobe, plunger means supported by said support means for supporting a stud so that a portion thereof is adapted to be inserted into an ear lobe when held by said clamping means, means for releasably holding said plunger means in a non-operative position, actuating means operable to simultaneously close said clamping means and pre-load said plunger means, and trigger means for actuating said holding means to release said pre-loaded plunger for movement of said stud toward said clamping means, said trigger means being located closely adjacent said actuating means whereby said device and said actuating and trigger means may be easily and conveniently held and operated by a single hand.

4,068,669

STIMULATOR FAULT PROTECTION CIRCUIT

Bill Howard Niemi, Brooklyn Park, Minn., assignor to Stimulation Technology, Inc., Minneapolis, Minn.

Filed Nov. 24, 1975, Ser. No. 634,577
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 R 15 Claims



1. A fault protection circuit for a medical unit having triggered output signal generator circuitry therein to provide a series of output signals, comprising:

means for monitoring said output signals from said medical unit output signal generator, said monitoring means being connected to said output signal generator;

means associated with said monitoring means for differentiating between successive signal values of said output signals monitored for detecting when said successive signal value differentials exceed a threshold; and

means connected to said differentiating and detecting means for affecting the operation of said medical unit signal generator upon the detection of said threshold being exceeded.

4,068,670

SMOKING COMPOSITION

Hiromu Yokota; Hajime Namikoshi, both of Himeji; Masataka Watanabe, Yokohama; Kunio Kato, Yokohama, and Akio Ohnishi, Yokohama, all of Japan, assignors to Daicel Ltd., Osaka and The Japan Tobacco & Salt Public Corporation, Tokyo, both of Japan

Filed Nov. 10, 1975, Ser. No. 630,272
Claims priority, application Japan, Nov. 11, 1974, 49-129699
Int. Cl.[2] A24B *15/00*
U.S. Cl. 131—2 18 Claims

1. A smoking product consisting essentially of a homogeneous mixture of cellulose acetate having a degree of substitution of from 0.5 to 2.0, and from one to 4 parts by weight of tobacco, per one part by weight of said cellulose acetate.

4,068,671

NICOTINE REMOVAL PROCESS

William J. Casey, Trumbull, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed July 25, 1975, Ser. No. 599,277
Int. Cl.[2] A24B *15/02*
U.S. Cl. 131—143 9 Claims

1. A process for removing nicotine from tobacco without substantially removing solubles other than nicotine which comprises forming an aqueous dispersion of particulate nicotine-containing tobacco at a pH of at least about 8.5, and rapidly air convection drying said dispersion at an elevated temperature and at air flow rates such that material temperature does not exceed about 200° F and at least 90% of the initial water content is removed within 2 minutes.

4,068,672

METHOD AND APPARATUS FOR BREAKING THE HABIT OF SMOKING

Romeo E. Guerra, Dallas, Tex., assignor to Alfohn Corporation, Irving, Tex.

Filed Dec. 22, 1975, Ser. No. 643,514
Int. Cl.[2] A24F *15/06*
U.S. Cl. 131—170 A 3 Claims

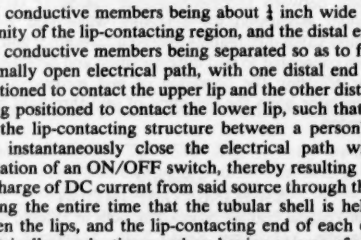
1. An anti-smoking device having utility in interfering with

a person's desire to hold an object (such as a cigarette, cigar or pipe) between his lips, comprising:

a. a generally tubular shell of electrically non-conductive material and having first and second ends, with a first end being adapted to receive a tobacco-holding object, and the second end thereof including structure adapted to be held between a person's lips;

b. a DC voltage source of at least 6 volts but not much more than about 9 volts, with said voltage source being mounted within the tubular shell; and

c. first and second electrically conductive members connected to the output of the DC source, with the distal ends of said conductive members extending alongside the lip-contacting structure of the tubular shell so that they may be readily touched by a person's lips, and the distal ends of



said conductive members being about ¼ inch wide in the vicinity of the lip-contacting region, and the distal ends of said conductive members being separated so as to form a normally open electrical path, with one distal end being positioned to contact the upper lip and the other distal end being positioned to contact the lower lip, such that placing the lip-contacting structure between a person's lips will instantaneously close the electrical path without actuation of an ON/OFF switch, thereby resulting in the discharge of DC current from said source through the lips during the entire time that the tubular shell is held between the lips, and the lip-contacting end of each of the electrically conductive members having an area of at least 0.06 square inch, such that injury to a person's lips is precluded as a result of current flow of about 1–5 milliamps from said source.

4,068,673

AWNING TYPE SUNSHADE

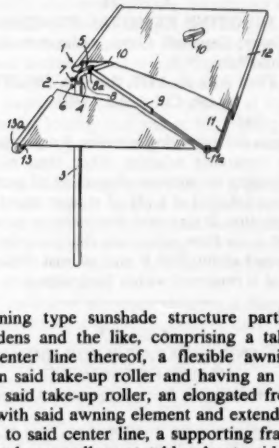
Dario Bernardi, Via Mazzini, 5, Cattolica (Forli), Italy

Filed June 28, 1976, Ser. No. 700,644

Claims priority, application Italy, July 3, 1975, 44017/75

Int. Cl.² E04F *10/06;* A45F *1/14*

U.S. Cl. 135—5 R **8 Claims**



1. An awning type sunshade structure particularly for beaches, gardens and the like, comprising a take-up roller defining a center line thereof, a flexible awning element woundable on said take-up roller and having an end thereof connected to said take-up roller, an elongated front member cooperating with said awning element and extending substantially parallel to said center line, a supporting frame for supporting said take-up roller rotatably about said center line thereof, a pair of telescoping arms, first hinge means for hingedly connecting first ends of said telescoping arms to said supporting frame and second hinge means for connecting second ends of said telescoping arms to said elongated front member, all said hinge means defining respective axis of rotation extending in a direction substantially parallel to each other and transverse to said center line, said telescoping arms being arranged to converge towards a common intersecting point thereof.

4,068,674

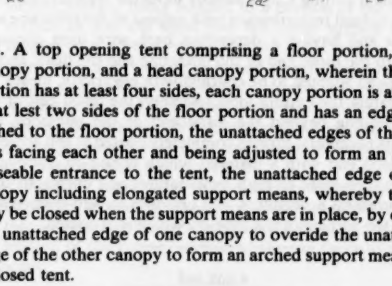
CAMPERS TENTING WITH A COMBINATION OF ENTRY AND SUPPORT MEANS

Hal D. Mitchell, Box 226, Rte. 4, Rolla, Mo. 65401

Filed Aug. 6, 1976, Ser. No. 712,205

Int. Cl.² A45F *1/08, 1/10*

U.S. Cl. 135—14 D **5 Claims**



1. A top opening tent comprising a floor portion, a foot canopy portion, and a head canopy portion, wherein the floor portion has at least four sides, each canopy portion is attached to at lest two sides of the floor portion and has an edge unattached to the floor portion, the unattached edges of the canopies facing each other and being adjusted to form an arcuate closeable entrance to the tent, the unattached edge of each canopy including elongated support means, whereby the tent may be closed when the support means are in place, by causing the unattached edge of one canopy to overide the unattached edge of the other canopy to form an arched support means and a closed tent.

4,068,675

INFLATABLE UMBRELLA

George Pappanikolaou, 621 90th St., Brooklyn, New York, N.Y. 11228

Filed June 14, 1976, Ser. No. 695,640

Int. Cl.² A45B *19/02*

U.S. Cl. 135—20 B **25 Claims**

1. An umbrella having a shaft and handle portion comprising: a flexible canopy having an inflatable enclosed space forming a part of said canopy; and having a self-contained compressible fluid reservoir containing a generally permanently closed or sealed fluid supply system communicating with said enclosed space; and means for compressing said fluid reservoir, whereby upon compression said fluid is forced into

said enclosed space thereby inflating said canopy of said umbrella, and restoration means expanding said fluid reservoir thereby evacuating said enclosed space to deflate said canopy.

4,068,676

METHOD FOR DISSOLVING POLYMERIC MATERIALS IN HYDROCARBON LIQUIDS

Donald J. Thorn, and John W. Burnham, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 26, 1976, Ser. No. 652,356
Int. Cl.[2] F17D *1/16*
U.S. Cl. 137—13 **28 Claims**

1. A method for producing a solution of a polymer dissolved in a hydrocarbon liquid consisting essentially of:

mixing an aqueous emulsion, having said polymer as the internal phase thereof, with a release agent in the immediate presence of said hydrocarbon liquid to thereby produce said solution within a time of about one minute wherein within said time said solution exhibits at least 65 percent less frictional resistance in turbulent flow than does said hydrocarbon liquid;

wherein said hydrocarbon liquid is selected from the group consisting of straight and branched chain paraffin hydrocarbons, cyclo-paraffin hydrocarbons, mono-olefin hydrocarbons, di-olefin hydrocarbons, alkene hydrocarbons, aromatic hydrocarbons, crude oil and mixtures thereof, said hydrocarbon liquid being in the liquid state at atmospheric conditions;

wherein said polymer is produced by the polymerization of compounds represented by the general formula

$$CH_2=\underset{\displaystyle R_2}{\overset{|}{C}}-R_1$$

and mixtures thereof, wherein R_1 is selected from hydrogen and alkyl radicals having 1 to 20 carbon atoms and R_2 is selected from methyl radicals, phenyl radicals, alkyl phenyl radicals having 7 to 26 carbon atoms and carboxylate radicals having 2 to 19 carbon atoms; and further

wherein said release agent is selected from the group consisting of anhydrous hygroscopic chemicals, selected from the group consisting of alkali metal and alkaline earth metal carbonates, bicarbonates, acetates halides, and sulfates; hygroscopic organic polymers, selected from the group consisting of water soluble polysaccharides, water soluble polyacrylamides, water soluble polyacrylic acids and vinyl ether maleic anhydride copolymers; concentrated aqueous solutions or inorganic salts, selected from the group consisting of alkali metal and alkaline earth metal halides; chemicals which react with water, selected from the group consisting of acetyl chloride, acetic anhydride, phthalyl dichloride, calcium oxide and aluminum trichloride; strongly acidic solutions of mineral acids having a pH of no greater than about 2; and strongly basic solutions of alkali metal hydroxides having a pH of at least about 10.

4,068,677

PROCESS CONTROL CIRCUIT FOR METAL-DEPOSITING BATHS

Hubert De Steur, Drougen, Belgium; Wolfgang Pernegger, Erlangen, and Egon Bussmann, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,784
Claims priority, application Germany, June 3, 1975, 2524589
Int. Cl.[2] G05D *11/13*; C25B *15/02*; C25D *21/14*
U.S. Cl. 137—93 **11 Claims**

1. A process control circuit adapted for the simultaneous and repeated control and monitoring of a plurality of parameters in at least one metal-depositing bath, comprising:

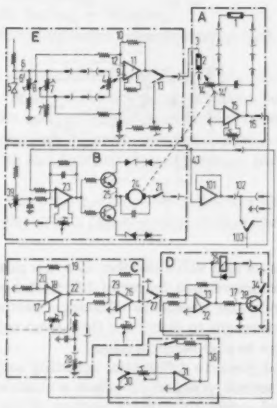
a. an independent parameter control circuit block for each of said plurality of parameters, each block having

i. measuring means for producing a measured value for one of said parameters;

ii. calibrator means connected to the measuring means for calibrating said measuring means;

iii. comparator means connected to said measuring means for comparing said measured value to a nominal value stored in said comparator means and creating a comparison signal;

iv. a dosing means connected to said comparator means for dosing said metal-depositing bath in response to said comparison signal;



b. a program generator means connected to each of the parameter control circuit blocks for controlling the operation of each in a simultaneous fashion so as to simultaneously control and monitor the bath parameters, said program generator means including at least

i. first switch means in each parameter circuit block for activating the calibrator means, and

ii. second switch means in each parameter circuit block for activating the measuring, comparator and dosing means to maintain tight control over the value of each parameter in the bath.

4,068,678

VALVE FOR HYDRAULIC SYSTEMS

Armin Lang, Schwabisch Gmund, and Rolf Fassbender, Mutlangen, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Apr. 20, 1976, Ser. No. 678,607
Claims priority, application Germany, Apr. 26, 1975, 2518738
Int. Cl.[2] G05D *11/03*
U.S. Cl. 137—100 **22 Claims**

1. Valve device for a booster steering hydraulic system having a main pump, a reserve pump, and a sump, for operating a pressure operated consumer;

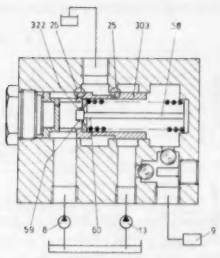
said valve device being for selectively controlling flow to said sump from said pums and comprising means effecting a pair of pressure chambers;

a pressure operable valve member and bias means biasing said valve member to a neutral position relative to said pressure chambers;

said valve member being actuatable by differential pressure between said pressure chambers wherein differential pressure is operative to shift said valve member from said neutral position in opposition to said bias means;

said valve device having pump, sump, and consumer passages for connecting to respective pump outlets and to said sump and consumer;

said valve device having a throttle;
said valve device having passage means whereby flow from said main pump passes through said throttle to said consumer passage and whereby said throttle communicates on opposite sides thereof with respective pressure chambers to effect a differential pressure between said pressure chambers for actuating said valve member responsive to a predetermined pressure differential;
said valve device having coacting flow control means whereby said valve member is operative to block flow from pump passages to said sump passage in said neutral position of said valve member;



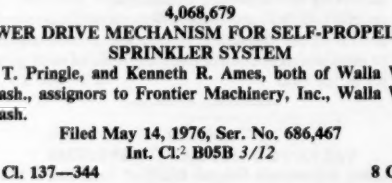
actuation of said valve member to a first position responsive to a predetermined degree of differential pressure between said pressure chambers effecting coaction of said flow control means to direct the flow from said reserve pump passage to said sump passage;
increased pressure differential actuating said valve member to a second position to effect a coaction of said flow control means to direct a portion of the flow from the main pump passage to said sump passage;
and flow rate responsive means operative to require a predetermined increase in the flow rate to effect a pressure differential for actuating said valve member to said second position disproportionately greater than the flow rate required for effecting actuation to said first position.

4,068,679

TOWER DRIVE MECHANISM FOR SELF-PROPELLED SPRINKLER SYSTEM

Ray T. Pringle, and Kenneth R. Ames, both of Walla Walla, Wash., assignors to Frontier Machinery, Inc., Walla Walla, Wash.

Filed May 14, 1976, Ser. No. 686,467
Int. Cl.[2] B05B 3/12
U.S. Cl. 137—344 **8 Claims**



1. In a self-propelled sprinkler irrigation system having an elongated water supply conduit elevationally supported by at least two spaced upright mobile tower assemblies, each of said tower assemblies comprising:
an upright frame operatively connected to the conduit and extending transverse to the longitudinal axis of the conduit;
said frame having leg members that extend downward and laterally outward from the conduit;
said frame having a hollow axle tube extending horizontally between the legs transverse to the water supply conduit;
wheel assemblies mounted on the frame adjacent ends of the axle tube for movably supporting the frame;
an electric motor mounted to the frame adjacent one end of the axle tube and operatively connected to one of the wheel assemblies for driving the one wheel assembly; and
interconnecting drive shaft extending axially through the interior of the hollow axle tube interconnecting the wheel assemblies to cause the wheel assemblies to be driven in unison with the tube protecting the interconnecting drive shaft from environment elements such as water and preventing the interconnecting drive shaft from becoming entangled with field debris or vegetational growth or engaging operating personnel.

4,068,680

SELF-CONTAINED VENT VALVE UNIT AND SYSTEM UTILIZING THE SAME

Boyd P. Sliger, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

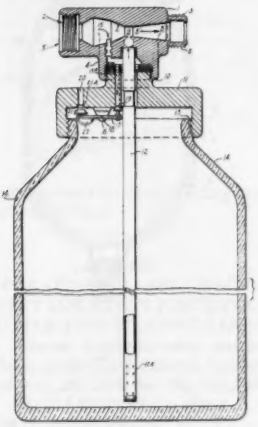
Filed July 21, 1976, Ser. No. 707,384
Int. Cl.[2] F16K 17/04
U.S. Cl. 137—512.1 **6 Claims**

1. In a liquid system wherein liquid is to substantially fill a cavity and thereafter be pressurized in said cavity and having a self-contained valve unit for said system that has a first valve means disposed in fluid communication with said cavity for venting air to a vent from said cavity during low pressure filling of said cavity with said liquid, said first valve means automatically closing upon the pressurization of said liquid in said cavity to a first certain value thereof, said valve unit having a second valve means disposed in fluid communication with said cavity for venting said liquid to said vent from said cavity when the pressure of said liquid reaches a second certain value thereof, said valve unit having a housing, said first valve means comprising a first valve seat carried by said housing and a first movable valve member for opening and closing said first valve seat, said second valve means comprising a second valve seat carried by said housing and a second movable valve member for opening and closing said second valve seat, said first valve seat and said second valve member being the same part that is movable relative to said housing, a spring being carried by said housing and is operatively associated with said part to tend to hold the same against said second valve seat to close said second valve seat, said housing having a stop for limiting opening movement of said part relative to said second valve seat, said part having opposed ends with an opening passing through said ends, one of said ends defining said first valve seat and the other of said ends defining said second valve member, the improvement wherein said stop comprises an annular shoulder of said housing that defines a circular opening that leads to said vent, said part being square in cross-section so as to provide flow paths along the sides thereof through said circular opening to said vent when the corners thereof are seated against said annular shoulder.

4,068,681
LIQUID PROPORTIONING DEVICE

Hugh Noel McNair, Fruitland Park, and Stuart William Olson, Leesburg, both of Fla., assignors to Hydro Mix, Inc., Lebanon, N.J.

Filed Oct. 10, 1975, Ser. No. 621,568
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—588 12 Claims



1. In the apparatus comprising an attachment device applicable to a container and adapted for the proportioned admixture and dispensing of liquids, a main conduit, a venturi in said main conduit for effecting a pressure differential determining high and low pressure sides thereof during the flow of liquid therethrough, a flow diverting conduit connected with the high pressure side of the main conduit and adapted to supply a diverted flow of liquid from the said main conduit to the container, a conduit connected with the throat portion of the venturi in the said main conduit, a metering jet having an orifice inlet and a passage of greater diameter relative to the said orifice, the said jet comprising the inlet end portion of said flow-diverting conduit, the said orifice being of a predetermined ratio relative to the venturi throat portion, the relationship of the said orifice to the venturi throat portion being adapted to afford a substantially fixed ratio through a wide range of pressures and flows in the said main conduit, a header adapted for attachment to a container, both the said flow-diverting conduit and the said conduit connected with the throat portion of the venturi extending through the said header, wherein the said header is equipped with suitable air vent means to allow the escape of air during the initial filling of the container with the liquid that initially flows through the main conduit, and wherein the said header member is equipped at its base with a container closure member and wherein the closure member is fitted on its lower side with a pivot support member and two connected valve closure members each suitably designed to alternately close the flow-diverting conduit and the air vent means.

4,068,682
TIMING DEVICE FOR FLUID VALVE

Charles P. O'Neil, Milwaukee, Wis.; Adam Smorzaniuk, West Millington, N.J., and James O. Young, Waukesha, Wis., assignors to Amerace Corporation, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,773
Int. Cl.[2] F16K *31/163, 11/04*
U.S. Cl. 137—624.11 20 Claims

1. In a timing device for actuating a fluid valve upon expiration of a prescribed time interval following a given event, the timing device including

a frame;

a motion transmitting member mounted in the frame for movement along a prescribed path of travel in either one of two directions between a first location and a second location;

timing means on the frame coupled with the motion transmitting member for effecting movement of the motion transmitting member at a predetermined rate in one only of said two directions to establish said timed interval between the departure of said motion transmitting member from the first location thereof and the arrival of the motion transmitting member at the second location, and permitting return movement of the motion transmitting member from the second location to the first location at an unrestricted rate;

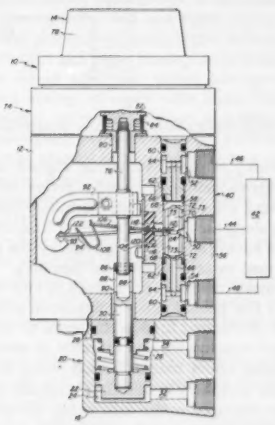
a fluid valve comprising:

a valve body having a chamber;

first and second passages communicating with the chamber;

a shuttle in said chamber movable between a first position, wherein the shuttle closes communication between one of said first and second passages and the chamber, and a second position wherein communication is open between both said first and second passages and the chamber; and

a shuttle in said chamber movable between a first position, wherein the shuttle closes communication between one



of said first and second passages and the chamber, and a second position wherein communication is open between both said first and second passages and the chamber; and

means responsive to the motion transmitting member for moving the shuttle from one to the other of said first and second positions upon the arrival of the motion transmitting member at the second location thereof;

the valve body includes a wall between the chamber and the exterior of the valve;

the means responsive to the motion transmitting member includes a snap-action mechanism coupling the motion transmitting member with the shuttle, the snap-action mechanism having a first lever extending through the wall, said first lever including a first end engaging the shuttle within the chamber, a second end outside the chamber and an intermediate portion passes through the wall, and wherein the snap-action mechanism includes

a second lever having first and second ends;

pivotal means mounting the second lever, adjacent the first end thereof, for pivotal movement relative to the frame and relative to the first lever;

a snap-action spring coupling the first and second levers adjacent the second ends thereof; and

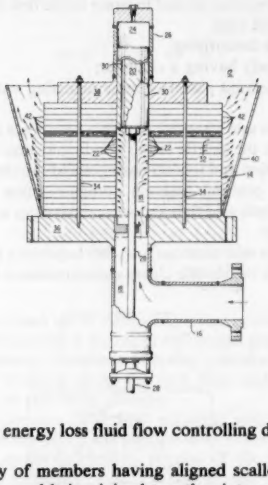
trip means coupling the second lever, adjacent the second end thereof, with the motion transmitting member.

4,068,683

HIGH ENERGY LOSS DEVICE

Richard E. Self, Los Alamitos, Calif., assignor to Control Components, Inc., Irvine, Calif.

Filed Sept. 9, 1975, Ser. No. 611,737
Int. Cl.[2] F16K *47/08*
U.S. Cl. 137—625.3 **7 Claims**



1. A high energy loss fluid flow controlling device comprising:

a plurality of members having aligned scalloped outer peripheries and being joined together into a rigid structure having a scalloped outer periphery continuously extending along the height of the rigid structure, said rigid structure having a series of high energy loss paths for fluid flow formed by said plurality of members;

inlet means centrally cut in each of said members according to a first geometrical configuration to define an inlet area for conducting fluid to the series of paths formed in said rigid structure by said plurality of members; and

scalloped outlet means formed along the entire scalloped outer periphery of said rigid structure to define a continuous scalloped outlet area along the entire height of said rigid structure.

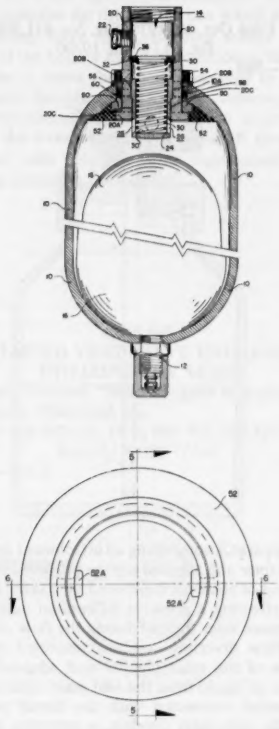
4,068,684

LOCKING RING ASSEMBLY FOR THE LIQUID PORT OF A PRESSURE ACCUMULATOR

Edward M. Greer, 820 Loma Vista Drive, Beverly Hills, Calif. 90210

Continuation of Ser. No. 603,339, Aug. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 585,034, June 9, 1975, abandoned. This application Sept. 22, 1976, Ser. No. 725,491
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—30 **2 Claims**

1. In a pressure accumulator including a rigid shell having an opening at one end thereof, a valve assembly mounted in the opening comprising: a tubular housing having an outer diameter less than the diameter of the opening and having a peripheral shoulder formed at the inner end thereof whose outer diameter is less than the diameter of the opening; a retaining ring formed of a plurality of arcuate segments mounted coaxially around the tubular housing and configured to engage said peripheral shoulder and also to engage the inner surface of the shell surrounding the opening; a resilient ring mounted concentrically around the inner end of the tubular housing and having an outer peripheral surface engaging the inner surface of the shell surrounding the opening, and said resilient ring further having a plurality of wedge-like portions, each extending radially inwardly with increasing transverse dimensions between



the segments forming said retaining ring to constitute a mounting means for the resilient ring on the retaining ring.

4,068,685

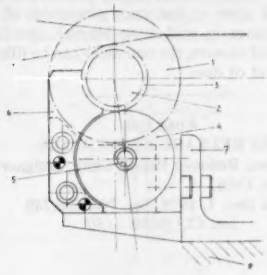
SUPPORTING MEMBERS FOR A REVOLVING COMB ON A MULTISHED WEAVING LOOM

Nicola Santucci, Schio (Vicenza), Italy; Zabotin Aleksandr Aleksandrovic, Moscow, U.S.S.R.; Loschilin Evghenii Dmitrievich, Moscow, U.S.S.R.; Galperin Aleksandr Lvovich, Moscow, U.S.S.R., and Onikov Eduard Archakovich, Moscow, U.S.S.R., assignors to Nuovo Pignone S.p.A., Italy and ZNIKHBI: Tsentralny Nauche - issledovatelsky institut khlopchatobumezhnol promyshlennestl, U.S.S.R.

Filed Sept. 30, 1976, Ser. No. 728,238
Claims priority, application Italy, Oct. 3, 1975, 27953/75
Int. Cl.[2] D03D *49/60, 47/26*
U.S. Cl. 139—188 R **5 Claims**

1. A device for supporting, at intermediate points, a revolving comb of a multished loom having weft-thread grasping and beating-up disks mounted in a ganged helical array on a shaft with spreaders therebetween, comprising: a base plate affixed to the frame of the loom, and a set of members on said base plate having a blade-like shape adapted to be inserted between the grasping and beating-up disks of the revolving comb until said members contact and act upon the spreaders confined between said disks, and wherein said members are mounted on said base plate so as to be spread relative to one another and to allow relative movement therebetween for undergoing small displacements in order to become spontaneously arranged in the desired position in contact with said spreaders, and said spreaders having cylindrical surfaces upon which said members

act and having a small size as compared to the size of the grasping and beating-up disks, to thereby provide for efficient



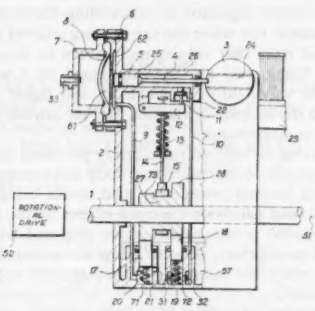
positioning of said members for counteracting the thrust originated by the weft-thread shot.

4,068,686

TECHNIQUE FOR CONTROLLABLY RECIPROCATING THE WEFT INSERTION PORTION OF A SHUTTLE-TYPE WEAVING LOOM

Vladimir Svaty, Liberec, Czechoslovakia, assignor to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Aug. 30, 1976, Ser. No. 718,793
Int. Cl.[2] D03D *47/24, 49/34*
U.S. Cl. 139—438 **10 Claims**



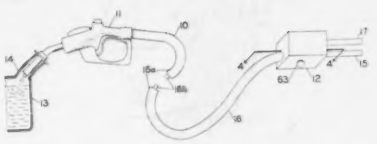
1. In a hydraulically-actuated weft insertion apparatus for a weaving loom that includes a reciprocable shuttle movable in both forward and reverse directions along a first path by means of a single piston attached thereto, the apparatus comprising, in combination, a first reservoir, an elongated drive shaft, means for rotating the shaft about its axis, a working cylinder extending in the forward direction along the first path, means supporting the piston for reciprocation in the cylinder, and means coupling the first reservoir to the cylinder for launching the shuttle in the first direction when the piston is moved forwardly in the cylinder from a rear-most position thereof under the force of hydraulic fluid in the first reservoir, the improvement which comprises, in combination, a unitary, substantially closed housing radially surrounding a portion of the shaft, the housing having a lower end in which the first reservoir is situated and an open end in which the cylinder is disposed, a second reservoir supported adjacent the rear end of the cylinder and having front and rear ends, a perforated plate disposed in the housing adjacent the rear end of the cylinder for providing fluid communication between the front end of the second reservoir and the rear end of the cylinder, first means disposed in the housing and coupled to the shaft for transferring fluid between the first and second reservoirs in first timed relation to the shaft rotation, and second means disposed in the housing and coupled to the shaft for transferring fluid between the first reservoir and the front end of the cylinder in second timed relation to the shaft rotation to initiate a reverse movement of the shuttle along the first path.

4,068,687

VAPOR RECOVERY LIQUID DISPENSING APPARATUS

Robert A. Long, R.R. No. 2, P.O. Box 158, Friendship, Wis. 53934

Filed July 1, 1976, Ser. No. 701,637
Int. Cl.[2] B65B *31/00*
U.S. Cl. 141—59 **22 Claims**



1. A liquid dispensing vapor recovery nozzle adapted for use with a vapor recovery vacuum pump which provides a source of vacuum, comprising:

a. a nozzle body having therein a vacuum chamber, a vapor inlet passageway in communication with said vacuum chamber, a vapor outlet passageway in communication with said vacuum chamber and said vapor inlet passageway, a liquid inlet passageway, and a liquid outlet passageway, said vapor inlet and outlet passageways being sealed off from said liquid inlet and outlet passageways to thereby prevent mixing of vapor with liquid flowing in said liquid inlet and outlet passageways, and wherein said vapor outlet passagway provides an outlet from said nozzle body which is adapted to be connected to a source of vacuum to thereby draw vapors through said vapor inlet and outlet passageways to discharge the vapor from said nozzle body to the source of vacuum;

b. a flow control valve normally blocking communication of said liquid inlet and outlet passageways;

c. a manually actuated lever adapted to open said flow control valve when said lever is manually operated and provide communication of said liquid inlet and outlet passageways;

d. a liquid discharge tube in communication with said liquid outlet passageway and having a liquid exit end opening through which liquid is discharged;

e. a vapor recovery tube which is in communication with said vapor inlet passageway and having a vapor entrance end opening through which vapor is received; and

f. vacuum actuated means responsive to lower than atmospheric pressure in said vacuum chamber and operably connected to said lever for disabling said lever in response to a selected low pressure in said vacuum chamber to prevent said lever from opening said flow control valve whereby, when vapors are being withdrawn from said vapor outlet passageway by a source of vacuum, a low pressure will be developed in said vacuum chamber sufficient to actuate said vacuum actuated means when said entrance end opening of said vapor recovery tube is substantially obstructed by liquid to prevent withdrawal of liquid through said vapor recovery tube.

4,068,688

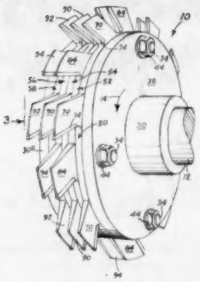
STACKED DISC FINGER JOINT CUTTER ASSEMBLY

George E. Benson, Elmira, Oreg., assignor to Industrial Carbide Tooling Incorporated, Eugene, Oreg.

Filed June 2, 1975, Ser. No. 582,864
Int. Cl.[2] B27G *13/12*
U.S. Cl. 144—90 A **14 Claims**

1. A finger joint cutter assembly comprising a plurality of cutters, each cutter including a disc of prese-

lected thickness and a plurality of cutter teeth secured to and projecting radially outwardly from said disc, said cutter teeth on a disc being thinner than said disc, having preselected lengths measured circumferentially of said discs and being spaced apart circumferentially about said



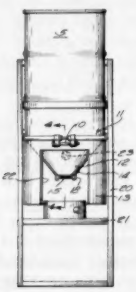
disc a distance greater than said preselected length, each of said discs being of substantially similar diameter, and connecting means for securing said cutters in face-to-face contiguous, concentric relationship with said cutter teeth on adjacent cutters spaced apart axially and circumferentially of said assembly.

4,068,689

TOOL FOR TRANSFERRING POWDERED MATERIAL FROM ONE CONTAINER TO ANOTHER

Frank B. Krull, P.O. Box 205B, Ingallston, Menominee, Mich. 49858

Filed Aug. 27, 1976, Ser. No. 718,392
Int. Cl.² B65B *1/04*
U.S. Cl. 141—93 **6 Claims**



1. A tool with which fine pulverized material such as aluminum powder can be transferred into an open-topped container from a receptacle having a cover removably secured to a rim encircling its mouth, without creating an objectionably dusty environment, which comprises:

A. a funnel of a size such that its large receiving end fits and is securable to the rim of the receptacle after its cover is removed;

B. means at the discharge mouth of the funnel providing a closure that can be opened and closed;

C. wall means fixedly secured to the funnel near its receiving end and projecting axially from its securement to the funnel towards and beyond the discharge end of the funnel in increasingly spaced relation to the funnel to form a skirt around the funnel, said skirt and funnel coacting to define a zone through which must pass the material leaving the receptacle and issuing from the funnel when the connected receptacle and funnel are inverted and the closure is opened; and

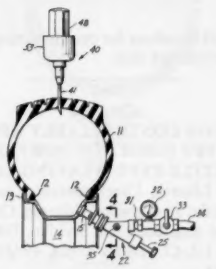
E. means whereby a subatmospheric pressure can be maintained in said zone so that upon placement of the open-topped container in said zone beneath the funnel and opening of said closure, the container can be filled without raising a cloud of dust.

4,068,690

AIR RELEASE REGULATOR

Ransome J. Wyman, Redondo Beach, Calif., assignor to Arnco, Marina del Rey, Calif.

Filed Dec. 1, 1975, Ser. No. 636,749
Int. Cl.² B65B *1/30*
U.S. Cl. 141—95 **5 Claims**



1. An air release regulator for controlling the escape of air from a pneumatic tire while the tire is being inflated and filled with a liquid resin that subsequently cures to form a solid elastomeric filling, said tire being mounted on a wheel rim having a tire valve through which air and liquid resin are injected into the interior of the tire, said air release regulator comprising, in combination:

a body having an internal passageway provided therein;

a hollow needle connected to said body and communicating with said internal passageway, said needle being adapted to pierce and penetrate the tread rubber on the tire;

a spring-loaded pressure-relief valve disposed within said internal passageway, so as to allow air within the tire to escape when the internal pressure exceeds a predetermined limit;

a vent opening extending from said internal passageway outwardly of said check valve, so as to allow air and liquid resin to escape from the tire; and

a cup attached to said valve body to catch liquid resin escaping from said vent opening.

4,068,691

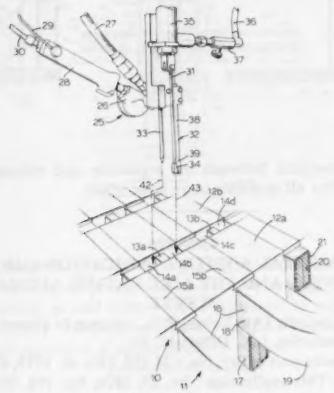
APPARATUS FOR INJECTING ELASTOMERIC MATERIAL

Palmer Lonseth; Hubert Gerald Panter, and Donald G. Moorby, all of Peterborough, Canada, assignors to Canadian General Electric Company, Toronto, Canada

Filed Feb. 10, 1976, Ser. No. 656,865
Claims priority, application Canada, Feb. 17, 1975, 220400
Int. Cl.² B67C *3/34*
U.S. Cl. 141—284 **5 Claims**

1. A gun for injecting an uncured, semiconducting, elastomeric material between coil sides and slot walls of an electromagnetic component of a dynamoelectric machine; said component including a core member having a plurality of stacks of magnetic laminations spaced apart axially to define interstack spaces; axially directed slots in said core member; spacers disposed radially in said interstack spaces and extending between said slots; and coil sides disposed in said slots; said gun comprising a body portion; material release means secured to said body portion and adapted for receiving said material

under pressure from a source; an injector tool having a stem projecting from said body portion and terminating in a head; a flat face on said head of length about equal to the radial dimension of a coil side and of width slightly less than the width of the interstack spaces; an orifice in about the middle of said face;



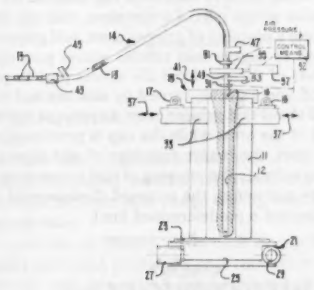
a flow passage connecting said orifice to the output of said release means; and means for securing said tool in an interstack space with said face pressed against a radial surface of a coil whereby the tool is in place for injecting said material between the coil side and the adjacent slot wall by actuating said material release means.

4,068,692

FUEL ELEMENT LOADING SYSTEM

Satya Prakash Arya, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Aug. 11, 1975, Ser. No. 603,531
Int. Cl.[2] B65B *1/08*
U.S. Cl. 141—392 **8 Claims**



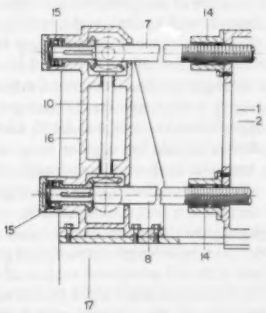
1. A nuclear fuel element loading system in combination with a fuel element having a plurality of longitudinal passages, each for receiving a plurality of fuel rods aligned axially therein, said system comprising, conveyor means for conveying fuel rods in succession into a tube disposed in axial alignment with and above the longitudinal passages, adapter means for guiding the fuel rods from said tube into the longitudinal passages, said adapter means defining a transfer passage extending from said tube to a longitudinal passage, said axially aligned tube including a section having two pinch valve means which are vertically spaced apart and insertion means for inserting a spacer element located between said two pinch valve means, means for operating said two pinch valve means and said insertion means to assemble two fuel rods in said tube section with a spacer element therebetween and to release the fuel rods to allow said released fuel rods and spacer element to fall together as a three-member group toward the fuel element, said transfer passage having a cross-sectional size which is larger than the cross-sectional size of the corresponding longitudinal passage by an amount sufficient that the entrance to the longitudinal passage is within the perimeter of said transfer passage for maximum misalignment due to dimensional variations within tolerances, and vibrator means for vibrating the fuel elements to cause the fuel rods to fall into the longitudinal passages, said vibrator means being adapted to impart both horizontal and vertical components of oscillation to the fuel elements.

4,068,693

TRAVERSING DEVICE FOR WOOD SHEARING MACHINE

Angelo Cremona, V.le Lombardia, 275, Monza, Italy (20052)

Filed May 17, 1976, Ser. No. 686,680
Claims priority, application Italy, June 26, 1975, 24800/75
Int. Cl.[2] B27L *5/06*
U.S. Cl. 144—178 **3 Claims**



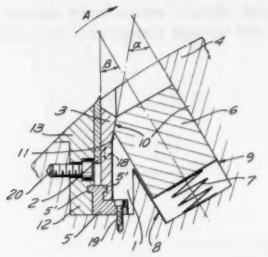
1. For use in a vertical type wood shearing machine having a bed, a pair of spaced apart guides, a side slide slideably mounted on said guides adapted for movement toward and away from a wood stock to be cut, a bar carrying unit and blade holding unit interconnected between said slides, the improvement of a traversing device for effecting the drive of said slides and connected bar carrying unit and blade carrying unit toward or away from the wood stock comprising a pair of spaced apart upper screws, said pair of screws being operatively connected to a corresponding slide adjacent the upper end of said slides and slightly above the bar carrying unit, a pair of lower screws, each of said lower screws being operatively connected to the lower end of said slides, and means for synchronizing the rotation of said upper and lower pair of screws whereby said bar carrying unit and blade carrying unit can be uniformally advanced toward or away from the wood stock, and reaction body means including thrust bearings therein being connected to said bed, said screws having the other ends thereof journalled in said reaction body means and reacting with said thrust bearing so that said screws resist any torque imparted to said bar carrying unit and blade carrying unit during a cutting operation.

4,068,694

CUTTER SHAFT FOR WOOD MACHINING APPARATUS

Arnold Schmidt, Gutenberg, and Hans Sybertz, Hargesheim, both of Germany, assignors to Hombak Maschinenfabrik KG, Bad Kreuznach, Germany

Filed July 1, 1976, Ser. No. 701,868
Claims priority, application Germany, July 14, 1975, 2531345
Int. Cl.[2] B27G *13/00*
U.S. Cl. 144—230 10 Claims



6. In a wood machining apparatus, a combination comprising an elongated cutter element having an axis and being rotatable in one direction about said axis and provided with at least one pocket extending in the longitudinal direction of said element from the peripheral surface of the latter into the same and having a bottom face; an elongated cutting knife located in said pocket and projecting with a cutting edge thereof beyond said peripheral surface, said cutting knife having a pair of substantially parallel side faces, one of said side faces leading in the direction of rotation of said element; a pressure plate abutting with one face thereof against said one side face of said knife; a wedge guided in a cutout of said element for movement in substantial radial direction of the latter and having a wedge face inclined at an angle to the direction of movement of the wedge and engaging a correspondingly inclined face of the pressure plate opposite said one face thereof, said angle being within a range that is outside the angular range at which self-locking occurs between said wedge and said pressure plate; biasing means engaging said wedge for biasing the same in radial outward direction; a part subject to wear located in said pocket and engaging the other side face of said cutting knife substantially over the whole length thereof, said part having an outer surface flush with said peripheral surface of said element, said one face of said pressure plate and a face of said wear part opposite said one face of the pressure plate both being provided with grooves extending in longitudinal direction of said shaft; a holding bar abutting against said bottom face of said pocket and having a pair of opposite lateral projections respectively located in said grooves; and means connecting said holding bar to said shaft.

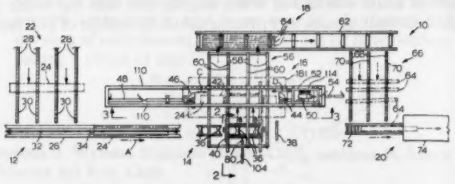
4,068,695

METHOD AND APPARATUS FOR CUTTING WOOD

J. Kenneth Seaman, Box 4013, Quesnel, B.C., Canada (V2J 3J2)

Filed Mar. 4, 1976, Ser. No. 663,583
Claims priority, application Canada, Feb. 13, 1976, 245685
Int. Cl.[2] B27B *1/00, 5/02*
U.S. Cl. 144—312 10 Claims

1. A method of cutting a log into lumber comprising: gripping opposed end portions of the log at a plurality of spaced-apart intervals by longitudinally compressing the log between a pair of opposed chucks, the chucks having radially extending blades for gripping the log; cutting the log radially and longitudinally between said spaced-apart intervals to form a plurality of wedge-shaped elongated segments; holding the segments at said spaced-apart intervals with said chuck blades to prevent



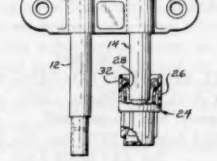
relative movement between the segments; and releasing the segments after all said cuts have been made.

4,068,696

SUPPLEMENTAL ADDITIVE INDICATION CAP FOR CONTAINERS AND THE LIKE HAVING AUXILIARY SLEEVE

David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 624,195, Oct. 20, 1975, Pat. No. 4,005,739. This application Nov. 19, 1976, Ser. No. 743,185
Int. Cl.[2] B65D *33/16*
U.S. Cl. 150—8 4 Claims



1. A supplemental additive indication cap adapted for installation on a tubular access port of a container, said cap defining at one end thereof a plurality of gripper arms, said gripper arms being positioned to engage said tubular access port upon attempted removal of the cap from the access port to prevent removal thereof, and a sleeve, carried by said cap and immovably positioned about said gripper arms, to prevent the manual disengagement of the arms while the cap is positioned on the tubular access port, the innner diameter of said sleeve being proportioned to enhance the gripping of said access port by the gripper arms by preventing the outward displacement of said gripper arms beyond a predetermined limit.

4,068,697

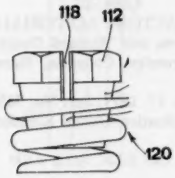
SELF-LOCKING SCREW NUT

Ubaldo Schiaffino, Via Tito Speri 18, La Spezia, Italy

Filed Sept. 1, 1976, Ser. No. 719,395
Claims priority, application Italy, Sept. 2, 1975, 69182/75
Int. Cl.[2] F16B *39/24, 39/36*
U.S. Cl. 151—19 R 1 Claim

1. In a self-locking screw nut including a central body with a screw threaded hole and an external surface having a prismatic portion for engagement by a tightening tool, and an externally tapering portion extending from said prismatic portion, these two portions being coaxial with the tapering portion decreasing in diameter in a direction away from said prismatic portion, said central body having a first longitudinal slit extending over the entire length thereof, and a second partial longitudinal slit extending over the prismatic portion and over part of the tapering portion, the improvement comprising a frustoconical helical spring having an inside diameter corre-

sponding to the external diameter of the tapering portion of the central body for application between said tapering portion and a surface to be clamped by said screw nut, said frustoconical helical spring being mounted on said tapering portion and extending axially beyond the free end thereof, the threads of



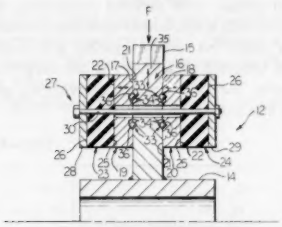
said frustoconical helical spring being spaced from one another in the unclamped position of said screw nut and approaching one another as said screw nut is tightened to exert pressure both radially inwardly and axially of said screw nut in the clamped operative positive thereof.

4,068,698

VEHICLE WHEEL HAVING RADIALLY MOVABLE IMPACT ABSORBING RIMS

Roger L. Boggs, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 9, 1976, Ser. No. 713,078
Int. Cl.[2] B62D *55/12;* **B60B** *9/12*
U.S. Cl. 152—27 **11 Claims**



1. Wheel apparatus, comprising:

a hub;

a movable rim connected to said hub;

a flange extending inwardly from the rim in a direction toward the hub, said flange having first and second opposed sides;

first and second floating plates each having first and second sides and being positioned on a respective side of said rim flange, said first sides being positioned closer to said rim flange than said second sides;

first and second biasing means each having first and second sides and being positioned on the second side of a respective floating plate with the biasing means second side being directed outwardly therefrom;

means for maintaining the first and second biasing means at preselected relative locations, said maintaining means including first and second load plates each positioned on the second side of the respective biasing means and an element movably attached to said plates, said element being adjustable for controllably exerting compression forces of a preselected magnitude on the biasing means in the installed position; and

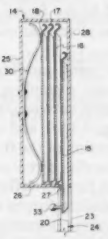
means for compressing the biasing means in response to movement of portions of the rim radially toward and from the hub.

4,068,699

FIREPLACE CLOSURE

Lyndell L. Tucker, 2035 Hickory Creek Drive, Humble, Tex. 77338

Filed Oct. 14, 1975, Ser. No. 621,700
Int. Cl.[2] E04F *10/08*
U.S. Cl. 160—33 **3 Claims**



1. In apparatus adapted for providing a temporary enclosure for an opening through a fireplace and the like wherein a pair of U-shaped guides are positioned in upright, facing, parallel relation to one another on opposite sides of the fireplace opening, and a panel-receiving housing having front, rear and bottom walls disposed horizontally above the channel guides and adapted for receiving panels in stacked relation and for dispensing the same through a slot in the bottom wall which is aligned in communication with the channel guides, the improvement comprising:

a plurality of substantially flat, rectangular, fire-resistant panels, each said panel having an upper and a lower horizontal edge, each said upper horizontal edge formed to cooperatively engage the lower horizontal edge of an adjacent panel wherein one edge includes an acutely angled, flat return lip projecting over the surface of its associated panel and wherein the horizontal edge of the adjacent panel is formed as a hooked portion of the associated said panel and projecting first obtusely away from the associated said panel and terminating in a reverse curved portion, the end of said reverse curved portion substantially returning to the plane of the associated said panel for releasably engaging said flat return lip;

force applying means for yieldingly urging said panels within said housing successively into alignment with said slot;

means for serially advancing said panels successively from the stack along said guide means, said panel edges being arranged such that said one edge of each said panel in succession receives said other edge of each next said panel in the stack as said panels are serially advanced through said housing slot into said guide means whereby said panels are urged into coplanar relation to one another to form a common closure across the opening between said guide means, allowing coplanar orientation of said panels within the channel guides; and

vertical channel-engaging edges on said flat panels including slide bearing means projecting in a lateral direction from said vertical channel-engaging edges for a distance sufficient to prevent said reverse curved portions and said hooked portions from contacting said channel guides as they are serially advanced along said channel guides.

4,068,700

DIVIDER SCREEN

George Legler, Kirkland, Canada, assignor to Precision Mfg Inc-Fabrication Precision Inv, St. Laurent, Canada

Filed July 23, 1976, Ser. No. 708,030
Int. Cl.[2] A47G *5/00*
U.S. Cl. 160—351 **7 Claims**

1. A partition with vertical and horizontal frame members

having mitered ends which are interconnected at the corners of the partition;

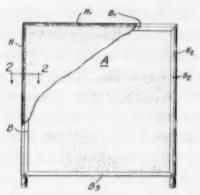
each frame member including a web and an integral pair of first flanges extending along the length thereof, each first flange terminating in an inwardly directed extension, the inwardly directed extensions of the vertical and upper horizontal frame members releasably engaging cooperating hooked ends of respective cap members which are releasably secured to the frame members, each cap member having a semicylindrical outer surface extending the length thereof;

each frame member being provided with a pair of spaced-apart second flanges extending the length of the frame members and situated between the first flanges, the second flanges being integral with and extending outwardly from the web in the direction of the first flanges and terminating short of the inwardly directed extensions of the first flanges, the second flanges stiffening the web of the frame member against binding forces applied thereto;

each of the cap members releasably connected to the vertical frame members having one of a pair of cooperating tape fasteners connected to the cylindrical outer surface thereof;

an inner surface of each of the second flanges being provided with a pair of spaced-apart grooves extending along a length thereof, the grooves of adjacent frame members meeting at the corners of the partition, the grooves forming cooperating pairs of inner and outer grooves in each cooperating pair of second flanges;

an angle member interconnecting adjacent horizontal and vertical frame members at each corner of the partition, the



legs of each angle member being mounted in the inner grooves of the second flanges and being releasably secured in position by means of fasteners extending through openings in the legs of the angle members and engaging cooperating openings in respective webs of the frame members, whereby secure corner joints of the frame members are provided at each corner of the partition; and

a partition leg mounted on each of the lower corners of the partition, each leg having a respective mounting bracket engaging a respective outer pair of cooperating grooves at the lower ends of one of the vertical frame members, the mounting brackets being releasably secured to the webs of the vertical frame members by threaded fasteners, the partition legs extending downwardly below the lower horizontal member and having a supporting member releasably connected thereto, the leg being a thick-walled tubular member, inner and outer surfaces of which are threaded to releasably connect the supporting member thereto, a pair of telescopically arranged cup members mounted on the leg between a lower edge of the panel and the support member, each cup member having a circular end wall and a cylindrical side wall extending at right angles thereto, the circular end walls of the cup; members having aligned openings therein for mounting of the cup members on the leg, adjacent ends of the cylindrical side walls of the telescopic cup members being in overlapping sliding engagement and moving relative to each other upon adjustment of the support member on the leg, an upper cup member being releasably secured to the leg adjacent a lower end of the leg mounting bracket and a lower cup member resting on an upper surface of the support member, the telescopically arranged cup members concealing the leg from view upon adjustment of the support member relative to the leg.

4,068,701

REFRACTORY MATERIALS

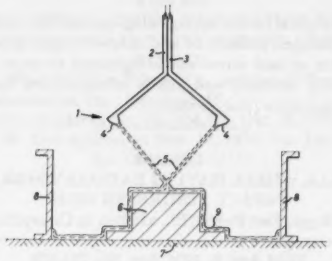
Harold Garton Emblem, and Richard Dudley Shaw, both of Cosmos House, Bromley Common, Bromley BR2 9TL, England

Filed Jan. 27, 1977, Ser. No. 763,147

Claims priority, application United Kingdom, Jan. 30, 1976, 3807/76

Int. Cl.[2] B22C 9/12, 5/08

U.S. Cl. 164—16 **11 Claims**



1. A method of preparing a mould or core for casting liquids such as molten metals, such method comprising the steps of coating a pattern with a mixture of two slurries each of which is substantially stable but which together gell to form a rigid coherent shape wherein each slurry is discharged as a stream onto the pattern, the two streams converging adjacent the pattern to mix the slurries.

4,068,702

METHOD FOR POSITIONING A STRONGBACK

Robert A. Herold, Tolland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 10, 1976, Ser. No. 722,181

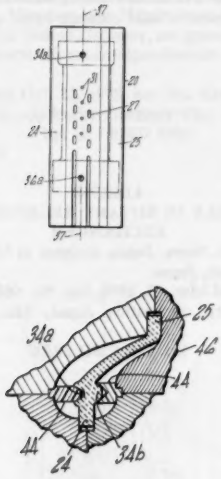
Int. Cl.[2] B22C 9/10, 7/02

U.S. Cl. 164—30 **5 Claims**

1. In making investment molds having a strongback suspended in the mold cavity thereof for casting articles having mating surfaces to be subsequently bonded together, wherein a strongback having bonding locators is first suspended in the cavity of a pattern mold for formation of expendable patterns of the articles thereon and then the assembly of strongback and patterns is surrounded by an investment mold, the improvement which comprises increasing the precision and reproducibility with which the strongback is positioned in the investment molds, including:

suspending the strongback in the pattern mold by expendable locating means adapted to engage the bonding locators, the locating means being initially incorporated into the patterns as they are formed and being subsequently removed, along with the patterns, after the investment mold is formed, the incorporation of the locating means into the patterns enabling the bonding locators to also serve as locators for positioning the strongback in the pattern mold, thereby eliminating dimensional and other tolerances between such locators and improving the preci-

sion and reproducibility with which the strongback is positioned in relation to the pattern mold, to the patterns



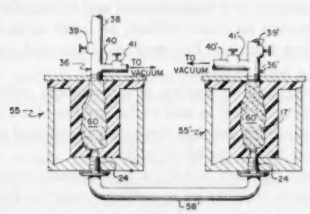
formed thereon and consequently to the investment mold ultimately formed therearound.

4,068,703

APPARATUS FOR CATALYTIC GASSING IN THE MANUFACTURE OF FOUNDRY CORES AND MOLDS

Andrew P. Dunlop, Riverside, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Sept. 10, 1975, Ser. No. 611,913
Int. Cl.² B22C *9/02*
U.S. Cl. 164—160 **4 Claims**



1. In an apparatus for shaping and hardening gas catalyst-hardenable binder-coated porous particulate masses, said apparatus comprising shaping means including a shaping cavity, and gassing means for introducing a gas-catalyst into interstitial voids in the particulate mass residing within said shaping cavity, whereby said gas catalyst is introduced at a first portion of the shaping cavity, the improvement comprising:

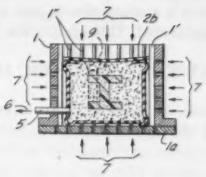
aftervoid chamber means connected directly to said cavity at a second portion thereof which is opposite said first portion of said shaping cavity, said aftervoid chamber means including a dead-end chamber of sufficient volume for the gas catalyst which is introduced at said first portion to pass at least through the entirety of the interstitial voids within said shaping cavity; and in which said aftervoid chamber comprises a second independent shaping means having a respective second shaping cavity filled with a second mass of said gas catalyst-hardenable porous packed liquid bound particulate material, and in which said means for connecting said first shaping cavity with said second shaping cavity are connected to the respective shaping cavities at second portions thereof opposite those respective portions of the respective shaping cavities into which the hardening gas is destined to be introduced.

4,068,704

CAVITYLESS CASTING MOLD

Adalbert Wittmoser, Lampertheim, Germany, assignor to Grunzweig & Hartmann und Glasfaser AG, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 682,037, April 30, 1976. This application Mar. 1, 1977, Ser. No. 773,168
Claims priority, application Germany, May 2, 1975, 2519463
Int. Cl.² B22C *15/22, 9/22*
U.S. Cl. 164—160 **7 Claims**



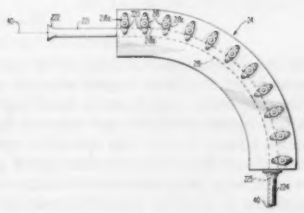
1. A cavityless mold for the casting of metallic articles, comprising a rigid shell with an open top and a perforated bottom, a first movable airtight membrane overlying said bottom, a second movable airtight membrane spanning said top, said membranes defining between them a space filled with a free-flowing mass of refractory particles and with a pattern imbedded in said mass conforming to the shape of the article to be cast, said pattern consisting of a material which is destructible by the heat of molten metal used in forming said article, inlet means extending to said pattern for introducing molten metal into the site of said pattern, and conduit means communicating with said space for establishing across each of said membranes a pressure differential tending to compact said mass from opposite sides around said insert.

4,068,705

FORMING APPARATUS WITH ROLLER GUIDE TUBE

Daniel B. Cofer, and Enrique Calixto Chia, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Division of Ser. No. 540,022, Jan. 10, 1975, Pat. No. 4,005,744, which is a division of Ser. No. 446,842, Feb. 28, 1974, which is a division of Ser. No. 109,421, Jan. 25, 1971, Pat. No. 3,806,366, which is a division of Ser. No. 808,976, March 20, 1969, Pat. No. 3,623,532. This application Aug. 30, 1976, Ser. No. 718,648
Int. Cl.² B22D *11/14*
U.S. Cl. 164—270 **3 Claims**



1. In apparatus for continuously forming metal rod including a casting machine, a rolling mill and a coiler, the combination therewith of means for pickling the rod after the rod leaves the rolling mill, guide means downstream of said pickling means for bending the rod from a substantially horizontal direction of

movement to a substantially vertical direction of movement substantially without engaging the rod with sliding friction, said guide means comprising an elongated guide tube defining an arcuate path along its length, and a plurality of rollers mounted outside of said guide tube and having only peripheral portions thereof extending through slots in the radial outer wall of said tube into the interior thereof so that said peripheral portions and the inner wall surfaces of said tube between said slots present a substantially continuous surface for guiding the rod through said tube.

4,068,706

THERMAL STABILIZATION OF CHLOROBENZENES

Walter Mahler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 470,636, May 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 365,274, May 30, 1973, abandoned. This application Apr. 15, 1976, Ser. No. 677,444

Int. Cl.[2] C09K *5/04, 15/02;* C07C *25/04, 25/10*

U.S. Cl. 165—1 **17 Claims**

1. In a method of heat transfer wherein at least one chlorobenzene of the formula

$C_6H_{6-x}Cl_x$

where x is 2 to 5

is cycled through a thermal gradient including temperatures above about 260° C, the improvement which comprises contacting said chlorobenzene with a thermal stabilizing amount of a solid acid acceptor selected from

a. a carbonate, phosphate, borate or molybdate of a Group I-A alkali metal of atomic number 3-55 of a Group II-A alkaline earth metal of atomic number 12-56, or

b. an oxide of a Group II-A metal of atomic number 12-56 or a Group II-B metal of atomic number 30-48.

4,068,707

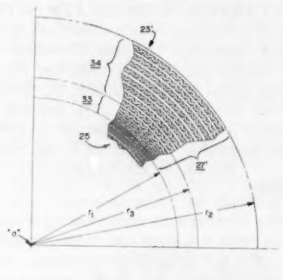
MATRIX STRUCTURE AND METHOD FOR MAKING

Chester John Dziedzic, Dushore, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 25, 1976, Ser. No. 661,261

Int. Cl.[2] F28D *19/04*

U.S. Cl. 165—8 **22 Claims**



1. In an annular matrix structure adapted for use in a rotary heat regenerator for a turbine engine wherein said matrix includes an inner operative region and an outer region substantially about said operative region and adapted for having a driveable means affixed thereto, said operative region defined by a plurality of radially alternating corrugated and flat ceramic strips each of a pre-established thickness and secured together to define a plurality of radially sealed axial flow passages, wherein said outer region comprises a plurality of corrugated and flat ceramic strips radially disposed in a predetermined pattern, a substantial portion of said strips of a thickness substantially greater than said preestablished thickness of said ceramic strips of said operative region,

the improvement wherein the total cross-sectional area of said outer region is within the range from about 8% to about 11% of the total cross-sectional area of said matrix structure, and the thickness of said substantial portion of said ceramic strips of said outer region is within the range of from about 2 to about 4 times greater than said preestablished thickness of said ceramic strips of said operative region.

4,068,708

SEAL ASSEMBLY IN ROTARY REGENERATIVE HEAT EXCHANGER

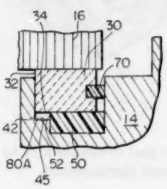
Yoshihiro Sakaki, Suwa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 18, 1976, Ser. No. 668,073

Claims priority, application Japan, Mar. 24, 1975, 50-38355[U]

Int. Cl.[2] F28D *19/00*

U.S. Cl. 165—9 **7 Claims**



1. In a rotary regenerative heat exchanger having a heat-transferring member which is cylindrical and rotatable on the longitudinal axis thereof and a stationary block member having a surface opposite to and spaced from an end face of the heat-transferring member, a seal assembly for providing seal between said end face and said surface, comprising:

a loop-shaped seal member having a substantially rectangular configuration of a heat-resistant and substantially rigid material having an outer surface, an inner surface, a flat front surface stretched between said inner and outer surfaces and a back surface;

a loop-shaped groove having a substantially rectangular configuration formed in said surface of the block member to have a width larger than the width of said seal member, said groove having an inner wall;

a loop-shaped back-up having a substantially rectangular configuration member of a resilient material tightly received in said groove, said seal member being received in said groove such that said front surface and said back surface of said seal member are kept in contact with said end face of the heat-transferring member and said back-up member, respectively, said back-up member being sandwiched with a compressive force between said back surface of said seal member and the bottom of said groove when said front surface is in contact with said end face, at least one of said groove and said back-up member being shaped such that a loop-shaped space is formed in said groove partly defined by said inner wall and an inner extreme region of said back surface, so that part of an inner surface of said back-up member comes into no contact with part of said inner wall of said groove; and

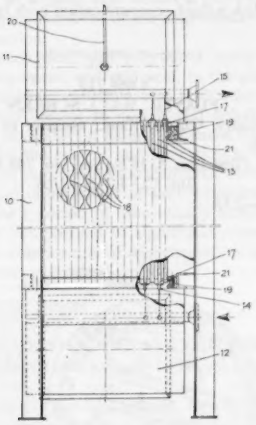
a loop-shaped auxiliary seal member of a resilient material arranged in said groove to provide seal between an outer wall of said groove and said outer surface of said seal member and keep said inner surface of said seal member in intimate contact with said inner wall of said groove with a compressive force.

4,068,709

DEVICE FOR CLEANING AND HEAT RECOVERY FROM THE EXHAUST GASES IN HEAT TREATMENT AND DRYING INSTALLATIONS

Alfred Schraud, Maschen near Hamburg, and Wolfgang Dressler, Wuppertal, both of Germany, assignors to Artos Dr.-Ing. Meier Windhorst Kommanditgesellschaft, Hamburg, Germany

Filed Oct. 22, 1975, Ser. No. 624,795
Claims priority, application Germany, Oct. 24, 1974, 2450497
Int. Cl.[2] F28D 9/00
U.S. Cl. 165—95 5 Claims



1. A device for the cleaning and heat recovery from the exhaust gases in a production installation for drying and heat treatment in the textile industry using a cooling fluid, comprising:

a housing having a multiplicity of vertically disposed, parallel, double-walled cooling plates through which cooling fluid may flow, disposed adjacent one another with the outer lateral faces of adjacent plates opposing one another and each being provided with laterally extending corrugations serving as distance spacers, said housing having a common support on which said plates are flexibly and slidably mounted, for movement toward and away from one another so that, when said plates are moved closely adjacent one another, they define narrow passages therebetween for the flow of exhaust gases therethrough and, when said plates are moved apart, they define wide spaces between the plates to facilitate their cleaning;

means for supplying exhaust gases from above said plates and means for discharging exhaust gases from below said plates, the gases passing through the narrow spaces between the opposed outer lateral faces of said adjacent plates from said supply means to said exhaust means; and

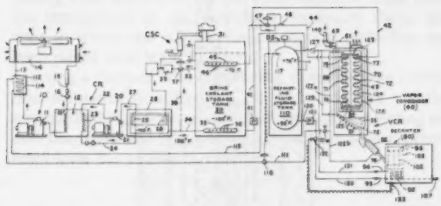
means for supplying cooling fluid coupled to the lower ends of said plates and means for discharging cooling fluid coupled to the upper ends of said plates, the fluid passing through the walls of said plates from said supply to said discharge means in a direction opposite to the flow of the exhaust gases.

4,068,710

VAPOR CONDENSER FOR VAPOR RECOVERY SYSTEMS

Ray C. Edwards, Kinnelon, N.J., assignor to Edwards Engineering Corporation, Pompton Plains, N.J.

Division of Ser. No. 598,004, July 22, 1975, Pat. No. 4,027,495.
This application Apr. 2, 1976, Ser. No. 673,270
Int. Cl.[2] F28B 3/00; F17C 7/02
U.S. Cl. 165—111 5 Claims



1. A vapor condenser for the recovery of the vapors of low volatile liquids such as hydrocarbons comprising,

a. housing means having an inlet means for vapors to be condensed, and an outlet means for venting air and other non-condensable gases,

b. a U-shaped flow passage means formed in said housing having an entrance flow passage connected to said inlet means and an exit flow passage connected to the outlet means,

c. condensing means disposed in the entrance flow passage and exit flow passage for condensing vapors passing through said U-shaped flow passage from the inlet means,

d. said condensing means consists of finned type condenser tubes lying transversely in the respective entrance flow passage and exit flow passage of the U-shaped flow passage means,

e. the fins on the finned type condenser tubes in the entrance flow passage being spaced substantially wider apart on those finned type condenser tubes closer to the inlet means then those which are more remote from the inlet means,

f. said housing forming a collecting space below said U-shaped flow passage means for collecting condensate formed by said condensing means, and to form a thermal trap with said U-shaped flow passage and

g. said housing having a discharge outlet for recovering condensate from said collecting space in the housing.

4,068,711

CASING CUTTER

Merle W. Aulenbacher, Conroe, Tex., assignor to International Enterprises, Inc., Houston, Tex.

Filed Apr. 26, 1976, Ser. No. 680,470
Int. Cl.[2] E21B 29/00
U.S. Cl. 166—55.3 16 Claims

1. A cutting tool comprising:

a housing member having a radial opening therethrough;

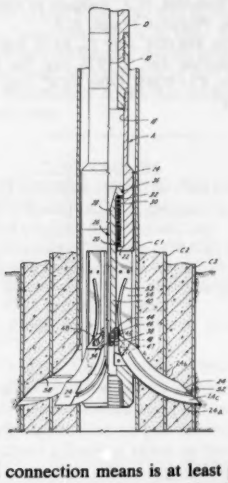
a cutting blade member movably mounted on said housing member for at least partial extension and retraction through said opening, said blade member having a cutting portion;

actuating means within said housing member and longitudinally movable in said housing member;

connection means pivotally connecting said blade member to said actuating means distal said cutting portion of said blade member; and

guide means cooperative with said blade member for translating a portion of the longitudinal force exerted on said blade member by said actuating means into a radial force whereby said blade member is moved in a path having both longitudinal and radial components with respect to

said housing member upon said longitudinal movement of said actuating means;



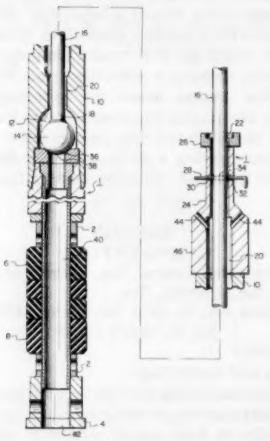
wherein said connection means is at least partially circumferentially offset with respect to said guide means.

4,068,712

WIRE-LINE RETRIEVABLE, MECHANICALLY OPERATED SPOT VALVE

L. G. Stump, Odessa, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Nov. 26, 1976, Ser. No. 745,312
Int. Cl.² E21B *33/16, 43/00*
U.S. Cl. 166—156 **6 Claims**



1. A spotting tool for use in placing a charge of liquid chemical downhole in a well by forcing the liquid chemical down a tubing string, having a seating nipple or the like affixed to its lower terminus, for expulsion from the lower terminus, said tool comprising:

A. an elongated, generally cylindrical housing having generally axially aligned passage therethrough extending between first and second ends thereof;

B. a valve disposed within said aligned passage intermediate the length thereof, said valve including a seat and a spherical moveable valve member for selectively engaging and disengaging said seat to correspondingly close and open said passage for fluid communication therethrough;

C. fluid seal means disposed circumferentially about said housing along at least a portion of the length thereof, said seal means being adapted to engage the internal walls of the tubing string and thereby effect a fluid seal in both axial directions therefrom;

D. actuator means coupled to said moveable valve member, said actuator means including an axially directed rod portion directly affixed to said moveable valve member and extending through said passage beyond said first end of said housing; and

E. a frangible member adapted to transfix said actuator with said housing such that said spherical moveable valve member normally sealingly engages said valve seat;

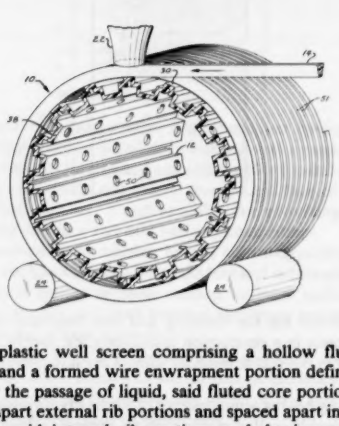
whereby an axial force applied to said rod portion serves to part said frangible member, thereby permitting said actuator to release said spherical moveable valve member from said valve seat to establish a fluid communication path through said passage.

4,068,713

PLASTIC WELL SCREEN

John S. McGuire, Olathe, Kans., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 8, 1976, Ser. No. 748,809
Int. Cl.² E21B *43/08*
U.S. Cl. 166—233 **5 Claims**



1. A plastic well screen comprising a hollow fluted core portion and a formed wire enwrapment portion defining open slots for the passage of liquid, said fluted core portion having spaced apart external rib portions and spaced apart internal rib portions, said internal rib portions each having a series of openings therein for the passage of liquid between the outside and inside of said fluted core portion, said internal rib portions having a width which is greater than the width of the external rib portions but less than the width of the space between adjacent pairs of external rib portions, the internal rib portions being joined to the external rib portions by generally radially extending wall portions, the wall portions which extend from the adjacent edges of adjacent internal rib portions cooperating with the inner surface of the external rib portions to define flow channels which are recessed outwardly of the inner surfaces of the internal rib portions.

4,068,714

METHOD FOR ACIDIZING SUBTERRANEAN FORMATIONS

James E. Hessert, and Brent J. Bertus, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 24, 1975, Ser. No. 643,986
Int. Cl.² E21B *43/26, 43/27*
U.S. Cl. 166—246 **19 Claims**

1. A method for acid treating a porous subterranean forma-

tion susceptible of attack by an acid and penetrated by a well bore, which method comprises:

injecting into said formation via said well bore a gelled acidic composition comprising

water;

a water-thickening amount of a water-dispersible biopolysaccharide produced by the action of bacteria of the genus Xanthomonas on a carbohydrate;

an amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to cause gelation of an aqueous dispersion of the components of said composition when the valence of at least a portion of said metal is reduced to said lower valence state;

an amount of a water soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state and cause said gelation;

an amount of an organic acid which is capable of reacting with a significant amount of the acid-soluble components of said formation;

said biopolysaccharide, said polyvalent metal compound, said reducing agent, and said acid, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition into said formation; and

maintaining said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to significantly react with the acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,068,715

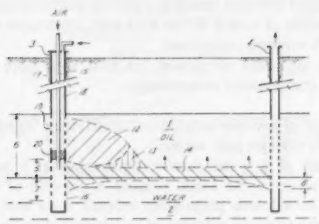
METHOD FOR RECOVERING VISCOUS PETROLEUM

Ching H. Wu, Golden, Colo., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 620,667, Oct. 8, 1975, Pat. No. 3,997,004. This application June 25, 1976, Ser. No. 699,752

Int. Cl.[2] E21B *43/24, 47/06*

U.S. Cl. 166—251 **18 Claims**



1. A method for recovering viscous petroleum from a subterranean, permeable, viscous petroleum-containing formation overlying and in contact with a water-saturated formation, said petroleum formation being penetrated by at least two wells which penetrate the water-saturated zone by a distance of at least 5% of the thickness of the petroleum-containing zone, comprising:

a. establishing a first fluid injection means in the first well between the surface and in communication with the bottom 5–25 percent of the petroleum-containing zone and a similar distance into the water-saturated zone; p1 b. establishing a second fluid injection means in the first well separate from the first fluid injection means between the surface and in fluid communication with at least a portion of the petroleum containing zone above the portion thereof with which the first fluid injection means communicates;

c. establishing fluid communication between the second well and the full thickness of the petroleum-containing zone plus a distance into the top of the water-saturated zone equal to from about 5 to 15 percent of the thickness of the petroleum-containing zone;

d. injecting heated air into the formation near the oil water contact via the first fluid injection means to establish an in situ combustion reaction at the point of contact between the bottom of the oil-containing zone and the top of the water-saturated zone;

e. continuing injection of air into the bottom of the oil-containing zone and the top of the water-saturated zone until the temperature in the petroleum formation above the zone in which the combustion reaction is occurring has been raised to at least 200° F;

f. injecting a thermal fluid comprising steam into the formation substantially above the oil water contact via the second fluid injection means while continuing injecting air into the first fluid injection means and producing petroleum from the production well.

4,068,716

OIL RECOVERY PROCESS UTILIZING AROMATIC SOLVENT AND STEAM

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 560,425, March 20, 1975, abandoned. This application Sept. 17, 1976, Ser. No. 724,131

Int. Cl.[2] E21B *43/24, 43/26*

U.S. Cl. 166—271 **16 Claims**

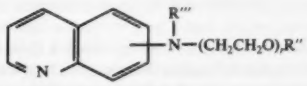
1. A method for recovering petroleum from subterranean, viscous petroleum containing formations including tar sand deposits, said formations being penetrated by at least one injection well and by at least one production well, comprising:

a. establishing a fluid communication path in the formation between the injection well and the production well;

b. injecting via an injection well a slug of an aromatic hydrocarbon solvent saturated with a material selected from the group consisting of carbon dioxide, a gaseous hydrocarbon and mixtures thereof into the communication path;

c. injecting via the sand injection well into the communication path an oil-displacing fluid selected from the group consisting of hot water, steam and superheated steam;

d. recovering petroleum from the formation via the production well, and wherein a solubilizing agent having the formula:



wherein r is an integer of from about 5 to about 50; wherein R″ is selected from the group consisting of hydrogen and —SO_3M, wherein M is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion and R‴ is selected from the group consisting of hydrogen and $(CH_2CH_2O)_rR''$ wherein r and R″ have the same meaning as previously described, is included with the oil-displacing fluid.

4,068,717

PRODUCING HEAVY OIL FROM TAR SANDS

Riley B. Needham, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 5, 1976, Ser. No. 646,468

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—272 **6 Claims**

1. In the recovery of heavy oil from an underground tar sand reservoir by injecting steam into at least one injection well penetrating said reservoir so that permeability of the reservoir is obtained and the tar sand contacted by the steam is heated

and mobilized, heavy oil is produced from at least one producing well penetrating the reservoir, the improvement of:

a. injecting a surface-active agent dissolved or dispersed in a suitable carrier into at least one injection well, thereby
b. generating a condensible foam,
c. penetrating the more permeable portions of said reservoir with said foam, thereby
d. diverting steam into less permeable portions of said reservoir, and
e. injecting an amount of steam into said underground tar sand reservoir to, at least, elevate the pressure in the reservoir contained by said condensible foam sufficiently to sustain the porosity of the tar sand reservoir.

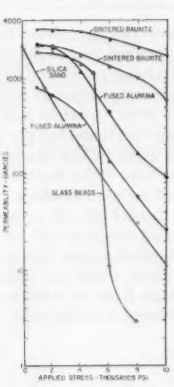
4,068,718
HYDRAULIC FRACTURING METHOD USING SINTERED BAUXITE PROPPING AGENT

Claude E. Cooke, Jr., Houston, Tex.; Walter A. Hedden, Worthington, and William C. Chard, Columbus, both of Ohio, assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 617,253, Sept. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 471,098, May 17, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,565

Int. Cl.[2] E21B *43/26*

U.S. Cl. 166—280 **15 Claims**



1. In a hydraulic fracturing method in which a fluid is injected into a subterranean formation to open a fracture therein, said formation being located at a depth in excess of about 7150 feet, the improvement wherein said fracture is propped with a slightly deformable, high strength propping agent having a permeability to brine at about 200° F which decreases not more than about three-fourths when the applied stress on said propping agent is increased from 1000 to 10,000 psi, said high strength propping agent comprising particles of sintered bauxite having a specific gravity greater than about 3.4, said particles prepared from bauxite material, substantially all of the grains of said bauxite material being about 12 microns or less.

4,068,719
METHOD FOR ACIDIZING SUBTERRANEAN FORMATIONS

Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 24, 1975, Ser. No. 643,987

Int. Cl.[2] E21B *43/26, 43/27*

U.S. Cl. 166—282 **19 Claims**

1. A method for acid treating a porous subterranean formation susceptible of attack by an acid and penetrated by a well bore, which method comprises:

injecting into said formation via said well bore a gelled acidic composition comprising

water;

an amount of a water-dispersible polymer of acrylamide which is sufficient to thicken said water;

an amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to cause gelation of an aqueous dispersion of the components of said composition when the valence of at least a portion of said metal is reduced to said lower valence state;

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state and cause said gelation;

an amount of a non-oxidizing acid which is capable of reacting with a significant amount of the acid-soluble components of said formation;

said polymer, said polyvalent metal compound, said reducing agent, and said acid, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition into said formation; and

maintaining said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to significantly react with the acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,068,720
METHOD FOR ACIDIZING SUBTERRANEAN FORMATIONS

James E. Hessert; Brent J. Bertus, both of Bartlesville, and Chester C. Johnston, Jr., Dewey, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 24, 1975, Ser. No. 643,985

Int. Cl.[2] E21B *43/26, 43/27*

U.S. Cl. 166—282 **21 Claims**

1. A method for acid treating a porous subterranean formation susceptible of attack by an acid and penetrated by a well bore, which method comprises:

injecting into said formation via said well bore a gelled acidic composition comprising

water;

an amount of a water-soluble cellulose ether which is sufficient to thicken said water;

an amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to cause gelation of an aqueous dispersion of the components of said composition when the valence of at least a portion of said metal is reduced to said lower valence state;

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state and cause said gelation;

an amount of a non-oxidizing acid which is capable of reacting with a significant amount of the acid-soluble components of said formation;

said cellulose ether, said polyvalent metal compound, said reducing agent, and said acid, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition into said formation; and

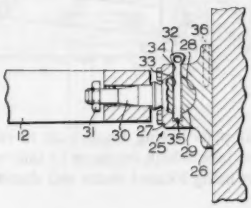
maintaining said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to significantly react with the

acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,068,721
BULLDOZER ASSEMBLY WITH LOCKING PIN AND METHOD

Robert J. Trayler, Braidwood, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 20, 1976, Ser. No. 752,708
Int. Cl.² E02F *3/76*
U.S. Cl. 172—1 **12 Claims**



10. A method for adjusting the angling of a blade relative to a frame of a bulldozer assembly wherein the blade is universally connected to said frame by a ball and socket connection comprising the steps of

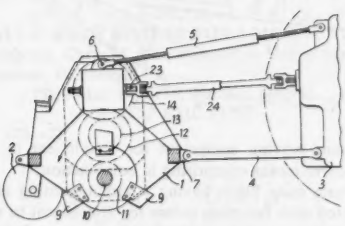
inserting a pin in said ball and socket connection to prevent tipping of said blade relative to said frame, and

angling said blade relative to said frame.

4,068,722
MANURE CRUSHING AND EARTH MIXING ROTARY MACHINE

Emile Le Guelennec, 56620 Bas Pont Scorff, France

Filed Feb. 2, 1976, Ser. No. 654,252
Claims priority, application France, Feb. 13, 1975, 75 04456
Int. Cl.² A01B *33/02, 33/08, 59/06*
U.S. Cl. 172—123 **2 Claims**

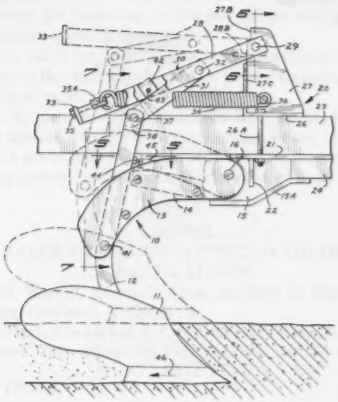


1. A combine manure-crushing and soil-mixing rotary machine adapted to be hitched to a tractor having a power take-off, which comprises a main frame having front and rear portions, a transverse shaft rotatably mounted in said frame and tool means mounted on said transverse shaft, gear means on said main frame for rotating said transverse shaft in opposite directions, said gear means comprising first means for receiving power from the power take-off of a tractor for rotating said transverse shaft in one direction and second means for alternately receiving power from the power take-off of a tractor for rotating said transverse shaft in the other direction, said first means extending toward the front of said main frame and said second means extending toward the rear of said main frame, a first set of hitching means disposed at the front of the main frame for coupling the machine to a tractor and a second set of hitching means disposed on the rear of the main frame for coupling the machine to a tractor, with said main frame reversed.

4,068,723
FLOATING BEAM PLOW

Sherman H. Quanbeck, Aneta, N. Dak. 58212

Filed May 28, 1976, Ser. No. 690,858
Int. Cl.² A01B *61/00*
U.S. Cl. 172—267 **17 Claims**

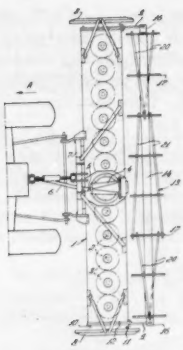


1. An earth working tool support mechanism comprising a frame, an earth working tool support shank carrying an earth working tool and extending upwardly from the earth working tool with which it is used, link means for connecting said support shank to said frame including a first link pivotally mounted to said frame about a first pivot and mounted to said support shank about a second pivot that is to the rear of and below the first pivot with the earth working tool in a working position, a second link assembly mounted to said frame about a third pivot spaced above said first pivot, and said second link assembly being pivotally mounted to said support shank at a fourth pivot spaced above the second pivot, said fourth pivot being below said third pivot with the earth working tool in a working position, said second link assembly comprising a toggle linkage having a pair of toggle elements pivotally connected together at a toggle pivot between said third and fourth pivots, and a stop to retain said toggle linkage in a latched position to form a rigid but foldable link, and a spring which exerts a load as it extends in length having a first end attached to one of said toggle elements to urge said toggle elements toward said latched position with the toggle pivot approaching a plane defined by said third and fourth pivots, said spring being mounted at a second end thereof to said frame at a location on a horizontal plane between said first and third pivots and said spring also thereby urging said first link and said second link assembly to pivot downwardly on the first and third pivots to carry an earth working tool carried by said support shank toward working position under spring force, the upper end of said support shank and said fourth pivot being free to pivot rearwardly about the second pivot to permit the earth working tool carried by the support shank to raise from its working position without tripping said toggle elements from their latched position, said toggle linkage being movable from latched position to a folded position under a predetermined compression load on said toggle linkage to permit the earth working tool carried by the support shank to move upwardly from working position while said support shank remains in one position about said second pivot, said spring being positioned to extend in length whenever the earth working tool carried by the support shank moves from its working position.

4,068,724
AGRICULTURAL IMPLEMENTS WITH SUPPORTING ROLLER

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 2, 1974, Ser. No. 466,458
Claims priority, application Netherlands, May 3, 1973, 7306136
Int. Cl.[2] A01B 21/00
U.S. Cl. 172—552 7 Claims



1. A combined supporting and soil compressing member comprising an elongated substantially horizontal central axis shaft and a plurality of substantially radial supports, mounted along the length of said shaft at substantially regular intervals, a plurality of elongate elements detachably mounted on said compressing member and said elements extending generally in the same longitudinal direction as said shaft, said elements being positioned adjacent the peripheries of said supports and forming an outer ground engaging periphery of said compressing member, said elements being included in at least two groups and each group comprising at least one pair of said elements, each of said elements having a length that is at least equal to twice the distance of an interval between neighboring supports but substantially less than the length of said shaft, the elements of one pair in one group being diametrically opposed to one another around said shaft, said two groups being angularly offset with respect to one another around said axis shaft by about 90° and located in different but adjoining regions of said combined compressing member, each of said regions spanning at least one interval and two supports that are not common to an adjoining region.

4,068,725
LUBRICATING SYSTEM FOR PLOW BLADES

William R. Watson, Burbank, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed May 19, 1976, Ser. No. 687,984
Int. Cl.[2] A01B 17/00
U.S. Cl. 172—801 5 Claims

1. A lubricating system for plow blades mounted on a vehicle comprising:

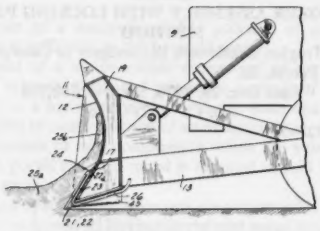
a. a lubricating fluid storage container;

b. a plow blade having a blade surface and a cutting edge at a lower edge of said surface, said cutting edge being formed by a lower edge of a cutting plate mounted to a lower portion of said blade surface, an offset being formed between said cutting plate and blade surface;

c. a tube outlet aligned to expel said lubricating fluid upward from said offset and onto said blade surface, said tube outlet being located above said cutting edge and at said offset;

d. a feed tube supplying the lubricating fluid to said tube outlet;

e. a pump leading from said storage container and connected to said feed tube; and



f. said cutting plate having a notch cut to receive a portion of the feed tube which connects to said tube outlet, said tube outlet being located under and shielded by said cutting plate.

4,068,726
GROUND-MOVING EQUIPMENT

LeRoy Marvin Heitman, 28900 Ironwood, Sunnymead, Calif. 92388

Filed May 28, 1976, Ser. No. 691,076
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—802 4 Claims

1. Ground-moving equipment for attachment to suitable motive power means comprising in combination,

an arcuate main blade having a ground-cutting edge and adapted with fastening means for attachment to said motive power means in a substantially horizontal position to be raised and lowered, and to be angled in the horizontal and vertical planes as desired,

an elongated auxiliary blade having a ground-cutting edge,

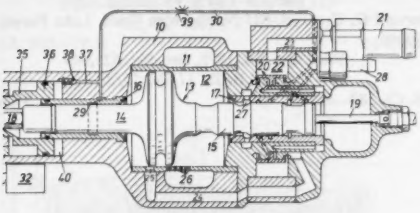
and means including hinge means connected to said auxiliary and main blades and a hydraulic actuator comprising remote control means and a source of hydraulic power, said actuator being connected to said main and auxiliary blades at such locations that said ground-cutting edge of said auxiliary blade can be positioned below and above the horizontal position of said main blade,

said hinge means constituting the sole support for said auxiliary blade against movement in a horizontal plane comprising a pair of sleeves fixed in spaced relation to said main blade and having individual ware bushings and a bifurcated mounting member on said auxiliary blade having a pair of spaced extensions straddling one of said sleeves, and a pivot pin positioned in aligned openings in said wear bushings and extensions to prevent movement other than rotational movement between said blades.

4,068,727
METHOD AND DEVICE FOR DAMPING THE RECOIL OF A WORK TOOL CONNECTED TO A ROCK DRILLING MACHINE

Kurt Holger Andersson, Tyreso; Carl Gösta Bernhard Ekwall, Saltsjobaden, and Bo Erik Forsberg, Vallingby, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 10, 1976, Ser. No. 665,630
Claims priority, application Sweden, Mar. 18, 1975, 75030387
Int. Cl.² B25D *9/00*
U.S. Cl. 173—1 **27 Claims**



1. A method for damping the recoil of a work tool comprising:

applying a feeding force to a percussive tool (10),

transmitting the feeding force to the work tool (18) over a retard piston member (36), said retard piston member being axially movable in a cushioning chamber,

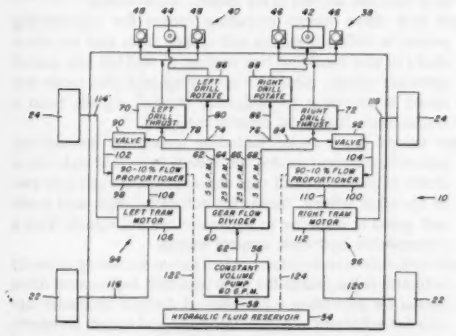
continuously supplying said cushioning chamber with pressurized fluid through a passage in the machine housing of the percussive tool, said machine housing being subjected during operation to a rearwardly acting force which includes a force caused by the recoil of the work tool, and

providing a floating impact position of said retard piston member by regulating at least one of the feeding force and the pressure in said passage relative to said rearwardly acting force so that said retard piston member during operation is maintained out of axial contact with said machine housing.

4,068,728
HYDRAULIC FLOW DIVIDER FOR A MINING VEHICLE

Joseph Subrick, Gary, W. Va., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 14, 1976, Ser. No. 686,963
Int. Cl.² E21C *11/02*
U.S. Cl. 173—27 **11 Claims**



1. A hydraulic flow divider system for a multi-function mine roof bolting vehicle, such vehicle having at least one drill head requiring a hydraulic input for rotating a drill steel, at least one drill head thrusting mechanism requiring hydraulic input for moving such drill head and drill steel toward the mine roof, and at least one tramming system requiring hydraulic input for moving at least one side of such bolting vehicle, said hydraulic flow divider system comprising:

means for retaining a quantity of hydraulic actuating fluid;

a pump for pumping such fluid from said retaining means at a constant volume;

means for dividing the flow of such fluid from said pump into at least two given constant volume flow paths, one of said paths providing hydraulic fluid to one of the elements requiring hydraulic input, the other flow path being split between the tramming system and the remaining hydraulic input requiring element;

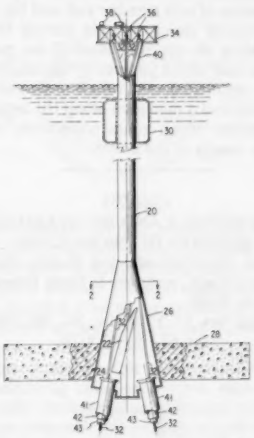
a divider valve for switching said other hydraulic flow path either to the tramming system or to the remaining hydraulic input requiring element; and

means for proportioning hydraulic flow, located between said divider valve and such tramming system for permitting a gradual flow of such hydraulic fluid to such tramming system for a smooth acceleration of such vehicle.

4,068,729
APPARATUS FOR MULTIPLE WELLS THROUGH A SINGLE CAISSON

Robert M. Peevey, Carriere, Miss., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 696,327, June 14, 1976, abandoned. This application Feb. 14, 1977, Ser. No. 768,019
Int. Cl.² E21B *15/02*
U.S. Cl. 175—8 **10 Claims**



6. An apparatus for a multiple well platform especially suited for deepwater production of hydrocarbons using at least three different size casings in each well and using a riser caisson adapted to extend from about the marine bottom to above the water level, said apparatus comprising:

a. a bottom section connectable to the lower end of said riser caisson, said bottom section having a plurality of generally downward-looking exit holes, each said exit hole being adapted to have a largest size casing mounted in said exit hole with the top of said largest size casing being at about the level of the said exit hole and with the diameter of said largest size well casing compared to the diameter of said riser caisson being such that the largest casings from all of said exit holes would not simultaneously fit in said riser caisson; and

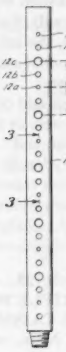
b. an orientable guide means located inside and generally on the vertical axis of said bottom section which guide means can be oriented to direct well drilling apparatus to any one of said exit holes such that wells can be drilled and casings installed through said exit holes.

4,068,730

DRILL COLLAR

James F. Arnold, 241 Kilts Drive, Houston, Tex. 77024

Filed Jan. 31, 1977, Ser. No. 763,101
Int. Cl.² E21B *17/00*
U.S. Cl. 166—320 **9 Claims**



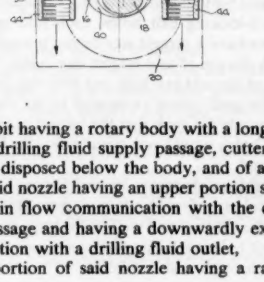
1. An eccentrically weighted drill collar for connection in a drill string above a drill bit in an earthen borehole comprising a straight tubular member having means at the lower end thereof for connection to a rotary drill bit to provide a common axis of rotation of said member and said bit; said member being weight-relieved along one side thereof to produce an eccentric weighting on opposite sides of the member corresponding to one-half to ten percent of the original weight of said collar; the amount of said weight removed varying between a maximum and a minimum along the length of each of a plurality of zones which zones collectively extend along substantially the length of the collar.

4,068,731

EXTENDED NOZZLE AND BIT STABILIZER AND METHOD OF PRODUCING

Lloyd L. Garner, San Clemente, and Charles Richard Harris, Whittier, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 17, 1976, Ser. No. 742,590
Int. Cl.² E21B *9/10*
U.S. Cl. 175—339 **4 Claims**



1. In a drill bit having a rotary body with a longitudinal axis of rotation, a drilling fluid supply passage, cutter means supported by and disposed below the body, and of a given gage,

a drilling fluid nozzle having an upper portion supported by the body in flow communication with the drilling fluid supply passage and having a downwardly extending free lower portion with a drilling fluid outlet,

the upper portion of said nozzle having a radially outer portion comprising a wear-resisting, bit stabilizing surface on a circle approximating the diameter of the bit,

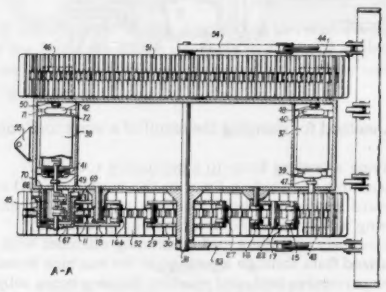
and the lower portion of said nozzle having a radially outer portion lying within a circle concentric to and of less diameter than that of said upper nozzle portion to protect said lower portion from wear and shock from the wall of a hole being drilled.

4,068,732

FOUR SPROCKET WHEEL DRIVE SYSTEM FOR TRACK-TYPE VEHICLE

Thorvald G. Granryd, 825 N. Sheridan Road, Lake Forest, Ill. 60045

Filed Oct. 14, 1975, Ser. No. 621,699
Int. Cl.² B62D *11/04, 55/30*
U.S. Cl. 180—6.7 **5 Claims**



1. A track-type vehicle comprising a frame, having a left side, a right side, a front and a rear,

a left side pair of sprocket wheels rotatably mounted on said frame at a point elevated from the ground and operatively engaged with a left side continuous track chain assembly for aiding in a clear operative engagement with said chain assembly, and

a right side pair of sprocket wheels rotatably mounted on said frame at a point elevated from the ground and operatively engaged with a right side continuous track chain assembly for aiding in a clear operative engagement with said chain assembly,

a front engine and a rear engine, both of said engines mounted transversely on said frame and both having opposing left and right drive shafts for transmitting power to a first and second drive means, respectively,

said first drive means including means for transmitting power in different modes and speeds from said left drive shafts of said front and rear engines to said left side pair of sprocket wheels, means for achieving each said mode and speed in response to hydraulic control signals from a transmission hydraulic control means,

said second drive means including means for transmitting power in different modes and speeds from said right drive shafts of said front and rear engines to said right side pair of sprocket wheels, means for achieving each said mode and speed in response to hydraulic control signals from a transmission hydraulic control means,

said hydraulic transmission control means including solenoid actuated valve means for each said first and second drive means for providing a plurality of distinct hydraulic signals for achieving a particular mode and speed, an operator control for simultaneously actuating each said solenoid actuated valve means for providing an identical control signal to each said first and second drive means to achieve a common mode and speed, and each said solenoid actuated valve means including an operator controlled override means for independently actuating each of said solenoid actuated valve means to provide a plurality of dis-

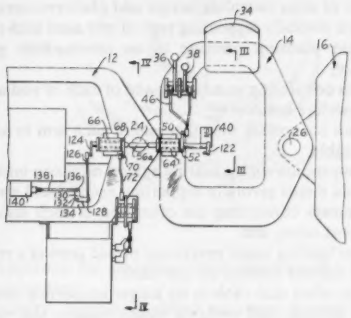
tinct control signals to a respective one of said first and second drive means to achieve a particular mode and speed, whereby the vehicle could be steered in various steering modes.

4,068,733

CONTROL LINKAGE FOR CROSSING PIVOTAL JOINT

Gerald Paul Simmons, Washington, and Frank August Grooss, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 2, 1976, Ser. No. 702,167
Int. Cl.² B60K *23/00*
U.S. Cl. 180—77 R **14 Claims**



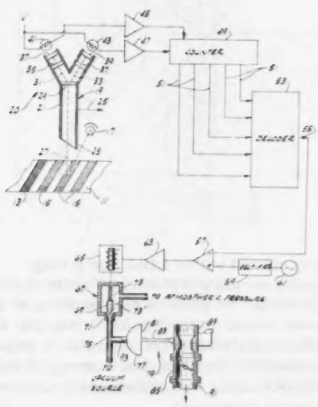
1. In an articulated vehicle having a first and a second frame pivotally connected together about a vertical axis, a link on said first frame, means on said first frame for imparting translation movement to said link, mounting means on each frame for rotatably carrying coupling means extending between the two frames, means on said first frame for converting said translation movement of the link to rotating movement of said coupling means, and means on said second frame for converting the rotating movement of the coupling means to actuating movement for an operating part of said vehicle.

4,068,734

AUTOMATIC VEHICLE SPEED LIMITING SYSTEM

James E. Foeller, 711 Mueller Road, Festus, Mo. 63028

Filed Jan. 8, 1976, Ser. No. 647,424
Int. Cl.² B60K *31/00*
U.S. Cl. 180—98 **7 Claims**



1. An automotive vehicle speed control system for being carried by a vehicle for automatically controlling the speed of the vehicle in response to external light signals, said system comprising:

means for optically detecting a first color signal;

means for optically detecting a second color signal;

a digital counter;

means for resetting the digital counter in response to each optical detection of the first color signal;

means for causing the digital counter to count to a number corresponding to the number of optical detections of the second color signal, the count number representing a speed limit for the vehicle;

means for converting the count in the counter to an analog reference signal;

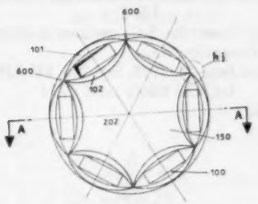
speed governing means for limiting the speed of the vehicle to a speed limit corresponding to the value of said analog reference signal; whereby the speed governing means limits the speed of the vehicle to said speed limit.

4,068,735

GROUND-REACTION MACHINES

Andre Grihangne, 186, Avenue Victor Hugo, Paris (16°), France

Division of Ser. No. 476,326, June 4, 1974, Pat. No. 3,987,866, which is a continuation of Ser. No. 241,029, April 4, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,861
Claims priority, application France, Apr. 9, 1971, 71.12639
Int. Cl.² B60V *1/16*
U.S. Cl. 180—128 **6 Claims**



1. A flexible enclosure for enclosing a fluid cushion to support a ground-effect machine having a platform, said enclosure comprising a plurality of separate cells, each of which forms a peripheral support plenum cushion, connected in series and adapted to be attached at an upper attachment section thereof along the periphery of said platform and surrounding a single undivided chamber, each of said cells being bounded by two converging, intersecting flexible walls connected to the flexible walls of adjoining cells, each upper attachment section being substantially rectangular in horizontal cross-section, the horizontal cross-sectional area of each of said cells decreases continuously from the upper attachment section at the periphery of said platform where air under pressure is fed to said cells, to a lower section thereof through which the air exits, each lower section being of bi-convex lenticular shape in horizontal cross-section.

4,068,736

METHOD AND DEVICE FOR REDUCING NOISE

Raymond H. Dean, Shawnee Mission, and Michael M. Roberts, Leawood, both of Kans., assignors to Tempmaster Corporation, North Kansas City, Mo.

Filed Apr. 14, 1975, Ser. No. 567,746
Int. Cl.² F01N *1/04*; G10K *11/04*
U.S. Cl. 181—224 **21 Claims**

1. A device for reducing substantially low frequency noise occurring or transmitted within the operating proximity thereof, said device comprising

a compliant sound absorption composite media, said media having an exposed fibrous structure and an acoustical resistance capable of dissipating sound energy therein from said noise by the fibrous media interaction, said composite media including an air impervious compliant

membrane attached to and enclosing said exposed structure, said composite media further having a combined membrane and fibrous structure thickness that is substantially equal to a quarter wavelength in the media for the frequency of the undesirable noise,

the air external to said composite media having a characteristic resistance to sound, the acoustical resistance of said media being substantially matched to said external air characteristic resistance at said undesirable noise frequency, and

means for supporting said media in proximity to said noise without substantially altering the acoustical wavelength and the acoustical resistance of said media.

4,068,737

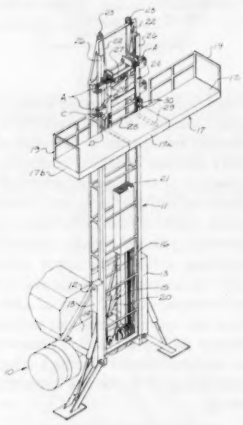
SAFETY DEVICE FOR MOBILE WORK PLATFORM LIFT

Leonard L. Lenz, Greenville, S.C., assignor to American Mobile Corporation, Greenville, S.C.

Filed June 16, 1975, Ser. No. 587,330

Int. Cl.[2] E04G *1/18, 1/34*

U.S. Cl. 182—63 **3 Claims**



1. In a mobile work platform lift assembly wherein a wheeled vehicle carries a pivoted tower movable from a substantially lowered position to an upright substantially vertical position for carrying a work platform and having a platform carriage movable responsive to a supporting cable on parallel rails longitudinally mounted on said tower, the improvement including:

A. means mounting the horizontal work platform on said platform carriage extending outwardly in cantilevered relation on said platform carriage;

B. a first pair of transversely spaced wheels carried on an upper portion of said platform carriage engageable with the rails on a side thereof remote from the work platform;

C. a second pair of transversely spaced wheels carried on a lower portion of said platform carriage engageable with the rails on the other side of the rails;

D. a stop member opposite said first pair of wheels on said other side of the rails in spaced relation thereto;

E. wedging means carried by said carriage opposite said stop member held out of engagement by said supporting cable when said platform carriage is supported thereby;

F. an oscillatable shaft carried transversely of said platform carriage in horizontal alignment with a respective rail;

G. linkage means normally held by cable tension so as to maintain said wedging means in deactivated position;

H. resilient means normally urging said linkage means to move said wedging means into wedging engagement with said rail;

I. an outwardly extending crank arm fixed adjacent one end to said shaft;

J. a pair of arms extending across said platform carriage;

K. means pivotally supporting each of said arms with respect to said platform carriage in an intermediate portion thereof;

L. means connecting an adjacent end of each of said arms to a respective crank arm;

M. means connecting the other end of each arm to an adjacent cable;

O. a compression spring bearing against each arm intermediate said means pivotally supporting each of said arms and said means connecting the other end of each arm to an adjacent cable; and

P. means limiting upper movement of said arms as a result of force exerted thereon by said cable;

whereby when said cable is no longer supporting said platform carriage said wedging means engages said rails engaging said stop member.

4,068,738

SCAFFOLDING

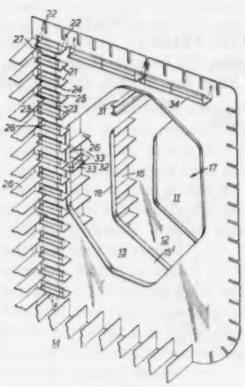
Ronald Reed, 6, Cutherbert's Terrace, Hexham-on-Tyne, Northumberland, England

Filed Nov. 17, 1975, Ser. No. 632,574

Claims priority, application United Kingdom, Nov. 18, 1974, 49827/74

Int. Cl.[2] E04G *3/10*

U.S. Cl. 182—128 **17 Claims**



1. Staging erected within a tank comprising:

a collapsible assembly of platforms fixedly secured at points spaced within the plane of each platform to three chains disposed within a three-point, triangular arrangement such that said platforms are suspended, in respective vertically-spaced horizontal planes, from said chains at a different distance, along said chains, which includes a substantial vertical component,

said assembly of platforms and chains being secured at the top and bottom thereof to an inner side wall of said tank or

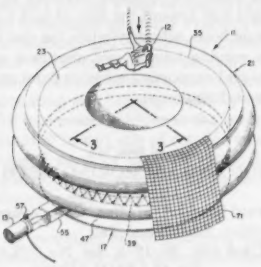
to the neighboring surface of the top or bottom of said tank.

4,068,739

DISASTER EVACUATION AIR CUSHION

Donald W. Gordon, 2718 Standish, Anaheim, Calif. 92806, and Dar A. Robinson, 9755 Matick, Sepulveda, Calif. 91343

Filed Apr. 9, 1976, Ser. No. 675,426
Int. Cl.[2] A62B *1/22*
U.S. Cl. 182—139 **21 Claims**



1. Apparatus for absorbing the momentum of a falling object, comprising:

a primary, flexible, air-filled enclosure impacted by said falling object;

a secondary enclosure; and

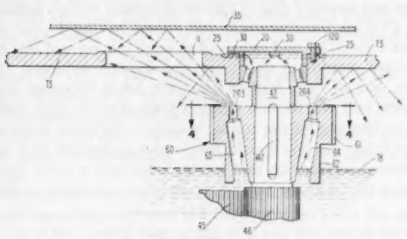
restrictive orifice means connecting said primary and secondary enclosures for permitting inflation of said secondary enclosure when said primary enclosure is impacted and for permitting reinflation of said primary enclosure by said secondary enclosure after said impact, said orifice means providing the primary path for the escape of air from said primary enclosure upon impact by said falling object.

4,068,740

GEAR PUMP ASSEMBLY

Jerome B. Quinn, Kennett Square, and Edward L. Heimark, King of Prussia, both of Pa., assignors to Philadelphia Gear Corporation, King of Prussia, Pa.

Filed June 23, 1976, Ser. No. 698,947
Int. Cl.[2] F01M *9/10*
U.S. Cl. 184—6.12 **16 Claims**



10. A gear train assembly comprising:

a. a gear box containing a reservoir of lubricant fluid;

b. a train of gears within said gear box;

c. a plurality of shafts within said gear box on which at least some of the gears of said gear train are mounted;

d. a member on one of said shafts adapted to function as a centrifugal pump;

e. said pump member having a lower body portion partially immersed in said reservoir of lubricant fluid;

f. at least one passageway extending through said pump member inclined outwardly upwardly;

g. said passageway terminating in an intake port at the lower surface of the pump member and terminating in a discharge port at the upper surface of said pump member;

h. said gear box having an upper plate;

i. said upper plate being provided with openings in alignment with said shafts;

j. bearings mounted in said openings for supporting the upper ends of the shafts;

k. caps covering said openings;

l. at least one additional opening in said upper plate for passage therethrough of lubricant fluid which is projected angularly upwardly by said pump member;

m. the upper surface of said upper plate being provided with a recessed area in which said openings for said bearing mountings are located;

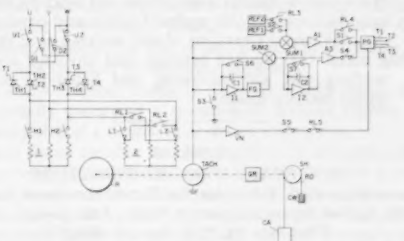
n. said caps being provided with ports for passage of lubricant fluid from said recessed area to bearings mounted in said openings.

4,068,741

ELEVATOR MOTOR CONTROL SYSTEM FOR A.C. INDUCTION MOTOR

Rene Ficheux, and Francois Ronsin, both of Paris, France, assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 19, 1976, Ser. No. 659,396
Claims priority, application France, Mar. 20, 1975, 75 08769
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R **6 Claims**



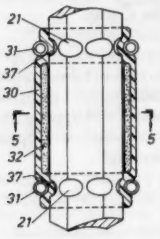
1. An elevator motor control system in which a three phase A.C. induction motor with fast and slow speed stator windings is accelerated by having its fast speed windings appropriately connected by switching apparatus to the supply lines of a three phase A.C. voltage source in at least two lines of which are current regulating devices for regulating the magnitude of alternating current applied to said fast speed windings in accordance with a signal representing the difference between a reference speed signal and the output signal of a tachometer generator driven in response to the rotation of said motor, wherein said switching apparatus operates in response to the location of said car at a predetermined distance from a landing at which a stop is to be made to disconnect said fast speed windings from and to connect said slow speed windings to said current regulating devices to receive three phase alternating current from said source in a phase sequence different from that by which said current was applied to said fast speed windings, said switching apparatus in operating also switching the control of said current regulating devices from said difference signal to an error signal derived by comparing said tachometer generator signal with a deceleration pattern signal produced by a function generator in response to the distance the car is calculated to be from said landing at which it is to stop, said calculated distance being represented by a continuously decreasing signal generated by an integrating circuit which integrates the signal produced by said tachometer generator after said car arrives at said predetermined distance and subtracts that integrated signal from a signal representing said predetermined distance.

4,068,742

VIBRATION DAMPER FOR IMPACT TOOL

Nils Carl Hakan Resare, Ektorp, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sept. 22, 1976, Ser. No. 725,564
Claims priority, application Sweden, Feb. 4, 1976, 7601167
Int. Cl.[2] F16F 9/10; B25D 17/12
U.S. Cl. 188—1 B **16 Claims**



1. In an impact tool comprising an elongated working part (10) which includes a shank portion (11) for connection to an impact machine, a working end (12) and a collar (14) intermediate said shank portion (11) and working end (12), said impact tool transmitting impact energy in its axial direction,

a vibration damper for damping lateral vibrations is said impact tool, comprising:

an envelope (30) surrounding a portion of the working part of the tool intermediate said collar and working end;

a liquid-like material (33) enclosed within said envelope for damping lateral vibrations of said working part; and

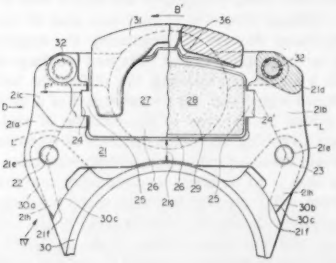
bag means (32) situated between said envelope and said working part and containing said liquid-like material within said bag means.

4,068,743

DISC BRAKE SUPPORT STRUCTURE

Yasuo Karasudani, Yokohama, and Tetsuo Haraikawa, Funabashi, both of Japan, assignors to Tokico Ltd., Japan

Filed June 11, 1976, Ser. No. 694,997
Claims priority, application Japan, June 20, 1975, 50-85876
Int. Cl.[2] F16D 55/00
U.S. Cl. 188—71.1 **3 Claims**



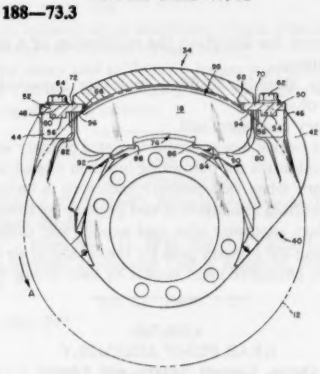
1. A disc brake comprising: a rotatable disc; a stationary supporting member, only two axially extending and circumferentially spaced, relative to the disc, mounting bolts securing said supporting member to a non-rotatable part of a vehicle on one side of the disc; a pair of friction pads on the opposite sides of the disc; a pair of axially extending and circumferentially spaced arms integral with the supporting member on which the friction pads are slidably guided and for receiving braking torque from the friction pads when the brake is actuated, and clamping means engaged with the friction pads for urging the friction pads against the disc; said supporting member having at least one abutment arm thereon extending from adjacent one of the mounting bolts radially inwardly toward the non-rotatable part and forming the other end of a lever the one end of which is formed by the portion of the supporting member between said mounting bolt and the point on the side of the supporting member corresponding to said bolt at which said friction pads are slidably guided and which lever is pivoted around said bolt, said abutment arm having an arm surface at the free end thereof; and an abutment integrally formed as part of said non-rotatable part and having a surface on the free end thereof against which the arm surface at the free end of said abutment arm abuts for opposing pivoting of said abutment arm around said bolt toward the part of said supporting member between said bolts, whereby when the disc is rotating with the periphery moving toward said abutment arm, the torque transmitted to said supporting member from said friction pads is opposed by said abutment.

4,068,744

FLOATATION AND ANCHORING MECHANISM FOR DISC BRAKE

Matthew Edward Markert, Medina, Ohio, assignor to The Bendix Corporation, South Bend, Ind.

Filed Aug. 30, 1976, Ser. No. 718,637
Int. Cl.[2] F16D 65/02
U.S. Cl. 188—73.3 **9 Claims**



9. In a disc brake, a rotor mounted for rotation with a member to be braked, said rotor having a pair of opposed friction faces, a pair of friction elements disposed adjacent said friction faces and adapted to frictionally engage the latter when a brake application is effected, a torque member mounted adjacent said rotor and having a pair of circumferentially spaced arms defining a recess therebetween, said recess having a pair of side edges defined by said arms and an edge joining said side edges, a caliper straddling said rotor and slidably mounted on said arms, one of said friction elements being mounted on said caliper, said one friction element anchoring through said caliper to one arm of the torque member, the other friction element being slidable in said recess and anchoring on a pair of abutment surfaces on said joining edge and a third abutment surface on the other arm when a brake application is effected.

4,068,745

DISC BRAKE

Tetsuo Haraikawa, Funabashi, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Aug. 10, 1976, Ser. No. 713,036
Claims priority, application Japan, Aug. 14, 1975, 50-98823; Aug. 14, 1975, 50-98828
Int. Cl.[2] F16D 55/224
U.S. Cl. 188—73.3 **6 Claims**

1. Floating caliper type disc brake apparatus, for use in association with a machine provided with base structure and a

brake disc mounted for rotation relative to said structure and having a pair of oppositely facing surfaces extending outwardly relative to the axis of rotation thereof and including respective brakable zones juxtaposed and adapted to be oppositely engaged by opposed braking means, said apparatus including:

a support assembly of generally bifurcated configuration having a bight portion and a pair of spaced arm portions;

first means adapted for rigidly mounting said support assembly on said structure with one of said arm portions being displaced from the other arm portion in a direction generally parallel to the direction of movement of said zones during rotation of said disc;

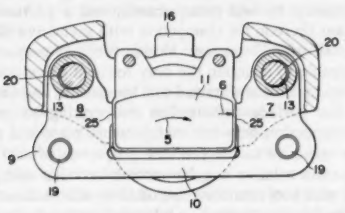
a housing assembly having a pair of spaced caliper portions;

second means, including a generally cylindrical hole in each of said arm portions and a generally cylindrical pin for each of said holes respectively extending through the corresponding hole and between said caliper portions, for shiftably mounting said housing assembly on said support assembly for movement relative to the latter along a path generally parallel to said axis of rotation of said disc with certain opposed parts of each of said caliper portions being in spaced, facing relationship to the respectively corresponding zone of said disc;

a pair of brake pads;

third means for mounting one of said pads on said parts of one of said caliper portions in facing relationship to one of said zones of said disc; and

fourth means for shiftably mounting the other of said pads on said parts of the other of said caliper portions in facing



relationship to the other of said zones of said disc and for shifting said other pad in a direction generally parallel to said axis of rotation of said disc toward and into forceful engagement with said other zone for both exerting a braking force on the latter and causing said housing assembly to shift along said path and thereby move said one pad into opposing braking engagement with said one zone of said disc;

the improvement of which apparatus further includes so constructing and arranging said second means that:

said pins are rigid and are in respective direct sliding relationship with those wall portions of the corresponding holes which are contacted thereby,

at least the one of said holes which is provided in said one arm portion is of substantially larger diameter than the corresponding one of said pins,

the spacing between the central axes of said holes is at least as great as the spacing between the central axes of said pins,

the differences between the diameters of each pin and its corresponding hole and the difference between the spacings of the central axes of the pins and the central axes of the holes are so related that said one pin is prevented from contacting the portion of the wall of said one hole remote from said other hole by said other pin first contacting the portion of the wall of said other hole proximate said one hole,

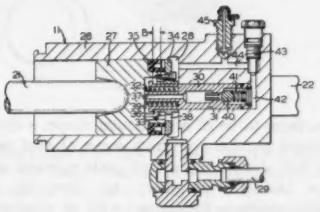
whereby, when lateral reaction forces are exerted on said pads in the general direction of said displacement of said one arm portion from said other arm portion during braking engagement of said pads with said zones of said disc, those lateral forces exerted upon said one pad will be transmitted through said housing assembly, is other pin and said other hole and applied to said other arm portion of said support assembly.

4,068,746

BRAKE CYLINDER DEVICE INCLUDING MEANS FOR AUTOMATICALLY COMPENSATING FOR BRAKE PAD WEAR

Kazuyoshi Munechika, Kobe, Japan, assignor to Nippon Air Brake Company Ltd., Kobe, Japan

Filed Nov. 15, 1976, Ser. No. 741,569
Claims priority, application Japan, Nov. 20, 1975, 50-158111
Int. Cl.[2] F16D *65/74*
U.S. Cl. 188—196 A **1 Claim**



1. A brake cylinder device for use in brake apparatus and comprising:

a. a casing;

b. a piston reciprocably disposed in said casing and effective when axially moved in one direction out of an initial release position, in response to pressurized hydraulic fluid supplied to a primary pressure chamber formed in said casing adjacent one side of said piston, for providing an application force for the brake apparatus;

c. a sleeve member coaxially disposed in said casing and normally occupying a spaced-apart position relative to said piston at a certain axial distance therefrom,

d. said sleeve member being engageable by said piston for movement therewith upon movement of the piston in said one direction in excess of said certain axial distance and having a pressure face at one end thereof subjectable to hydraulic pressure in an equalizing chamber formed in the casing adjacent said pressure face, said equalizing chamber being communicable with hydraulic pressure in said primary chamber via a passageway extending coaxially through the sleeve member for effecting equalization of hydraulic fluid pressure between the two chambers;

e. a precalibrated spring coaxially disposed between said piston and said sleeve member for biasing the piston and the sleeve member to said spaced-apart position relative to each other;

f. positioning means for positioning said sleeve member at said certain axial distance from said piston incidentally to return of the piston to a subsequent release position, notwithstanding that said subsequent release position does not coincide with said initial release position; and

g. a one-way check valve interposed in said passageway in said sleeve member providing flow in a direction from said primary pressure chamber to said equalizing chamber only.

4,068,747

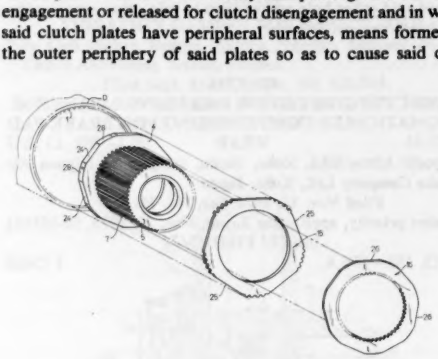
MULTI-PLATE CLUTCH HAVING MEANS TO PREVENT PLATE FLUTTER

Joseph B. Snoy, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Sept. 23, 1976, Ser. No. 725,773
Int. Cl.[2] F16D *13/64*
U.S. Cl. 192—30 V **11 Claims**

1. In a multi-plate friction type clutch having interleaved

clutch plates which can be axially clamped together for clutch engagement or released for clutch disengagement and in which said clutch plates have peripheral surfaces, means formed on the outer periphery of said plates so as to cause said outer



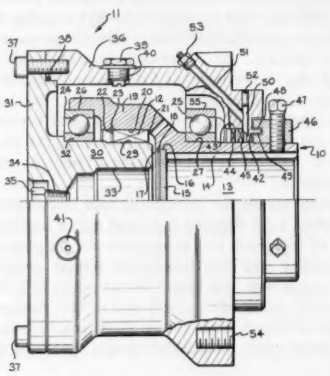
peripheral surfaces to be of non-circular shape, a clutch hub having a splined portion on which some of said plates are splined, said hub also having a back plate portion, said back plate portion having a periphery, and irregular portions formed on said periphery for contact with an adjacent plate.

4,068,748

SHAFT MOUNTED STANDBY DRIVE CLUTCH

Loris Joseph Charchian, Troy, Mich., and David Charles Heidenreich, Middleburgh Heights, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 6, 1976, Ser. No. 747,754
Int. Cl.² F16D *41/07*
U.S. Cl. 192—41 A **8 Claims**



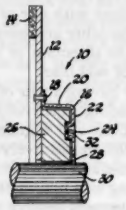
1. In a clutch assembly comprising a first driving member, a second driving member and means selectively locking said members for rotation the improvement wherein said first and second driving members are supported by and one another by a pair of bearings one of said bearings being supported on its interior by said first member and on its exterior by said second member and the other of said bearings being supported on its interior by said second member and on its exterior by said first member.

4,068,749

CLUTCH PLATE AND DAMPER ASSEMBLY

Warren W. Antrim, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 9, 1976, Ser. No. 694,210
Int. Cl.² F16D *3/14*
U.S. Cl. 192—106.1 **3 Claims**



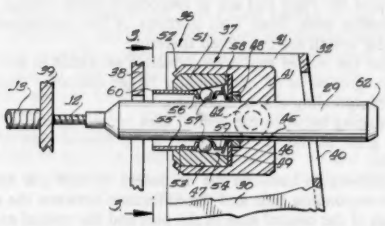
1. A clutch plate and damper assembly for use in a drive system having an engine and a drive shaft comprising; a pressure plate; an annular friction facing secured to said pressure plate adjacent the outer periphery thereof adapted to be driven by said engine; a retainer member secured to said pressure plate intermediate the center and outer periphery thereof, said retainer having an annular wall portion spaced from said pressure plate, and at least one protuberance formed in said annular wall; and a hub member disposed between said pressure plate and said retainer, said hub member having an indentation complementary to said protuberance, and a portion having drive means thereon for connection with said drive shaft; said annular wall of said retainer having resilient properties and being operable to maintain the only resilient drive connection between said pressure plate and said hub means, and said protuberance and surface deformation cooperating to provide a friction connection between said pressure plate and said hub means in response to the resilient properties of said annular wall to permit relative angular motion between said pressure plate and said hub member controlled by the resilient properties and the friction connection whereby torsional vibrations of the engine are isolated from th drive shaft.

4,068,750

AUTOMATIC ADJUSTER FOR CLUTCH LINKAGES

Sidney Ulane Gatewood, Roseville, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 22, 1976, Ser. No. 753,328
Int. Cl.² F16D *13/75*
U.S. Cl. 192—111 A **17 Claims**



1. A self-adjusting actuating mechanism comprising a pivotally mounted arm, stop means adapted to limit movement of said arm at a first position, spring means urging said arm to the first position, a flexible cable connecting said mechanism with a device to be actuated and terminating at one end in an elongated shaft portion, and gripping means positioned in said arm receiving said elongated shaft portion and including a collar pivotally mounted in said arm and having an internal conical

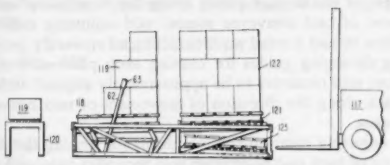
surface, a generally cylindrical ball retainer substantially completely received and axially reciprocable in said collar and receiving said elongated shaft portion therein, a plurality of balls in said retainer and adapted to wedge against said conical surface and the elongated shaft portion, biasing means within said collar urging said ball retainer and balls to their wedging position, said ball retainer extending beyond said collar towards said stop means, and means acting to exert a preload force on said cable and elongated shaft portion.

4,068,751

GRAVITY FEED-RETURN PALLET STORAGE RACK

Victor D. Azzi, Durham, N.H., assignor to The Kingston-Warren Corporation, Newfields, N.H.

Filed Jan. 29, 1976, Ser. No. 653,482
Int. Cl.[2] B65G *13/10*
U.S. Cl. 193—36 **27 Claims**



1. In a unitary gravity storage pallet platform,
a rear, reserve and empty pellet storing section comprising
an upper, forwardly inclined, reserve pallet receiving roller trackway, and
a lower, rearwardly inclined, empty pallet receiving roller trackway,
the planes of said upper and lower rear-section trackways non-intersecting within said frame; and
a front, active pallet storing section comprising
a platform-independent, active pallet receiving and discharging roller trackway, and
means for shifting said active pallet trackway, by simultaneous movement thereof in both translation and rotation, between an upper, full pallet receiving position of the same upper plane and forward inclination as said upper rear trackway, and a lower, empty pallet returning position of the same lower plane and rearward inclination as said lower rear trackway,
said upper and lower rear platform section trackways both non-extending to said front platform section whereby said shifting means is free to effect its said simultaneous movement shifting of said front section trackway between its said upper and lower, same-plane-and-inclination positions without interference with said rear section trackways.

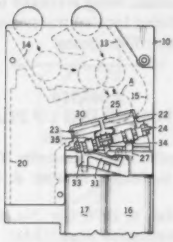
4,068,752

INTERACTING COIN-BLOCKOUT UNITS FOR A PREFERRED LOADING OF COIN TUBES

Bart G. Martin, St. Louis, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Aug. 30, 1976, Ser. No. 718,779
Int. Cl.[2] G07F *1/00*
U.S. Cl. 194—1 H **8 Claims**

1. In a coin-feeding assembly:
a. means providing a common inlet path through which a coin can move edgewise, and a pair of reception paths generally below the inlet path,
b. a pair of coin-control units pivotally mounted generally above the reception paths for individual swinging movement of the units,
c. one coin-control unit including:
1. a coin-blockout deflector movable into and out of a position in the inlet path in which the deflector blocks entry of a coin to one of the reception paths and directs the coin to the other of the reception paths, and
2. a finger in said one reception path and responsive to the entrance of a coin into said one reception path when the deflector of said one unit is out of its blocking position for swinging the deflector into said position, and
d. the other of the coin-control units including:



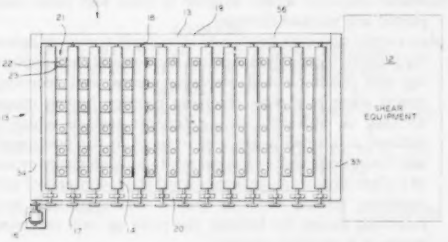
1. a first finger movable into and out of a position in which the first finger retains the coin introduced into the said reception path, and
2. a second finger in the said other reception path and responsive to the impact of a coin deflected by said one unit into the said other reception path for pivoting the said other unit and moving the said first finger out of its coin-retaining position to release the retained coin.

4,068,753

SHEAR FRONT FEED SYSTEM

David J. Jarman, Aurora, Ind., assignor to Continental M.D.M., Inc., Aurora, Ind.

Filed Mar. 4, 1976, Ser. No. 663,669
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—373 **3 Claims**



1. A shear front feed system for feeding sheet metal into the front of a shear,
said system including conveyor means for receiving said sheet metal and transferring it to the front of the shears for shearing operations,
said conveyor means having a sheet metal receiving end remote from said shears and a sheet metal transferring end adjacent said shears,
said transfer end being separated from said receiving end by the length of said conveyor means,
said conveyor means comprising a plurality of parallel spaced apart powered roller means for moving the sheet metal in a substantially straight line from the receiving end to the transferring end,
each of said roller means extending from one side of the conveyor means to the opposite side transverse to the length of the conveyor means from the receiving end to the transferring end,
ball transfer means free to rotate in any direction mounted

on said conveyor means for facilitating the movement of the sheet metal from the normal straight line motion actuated by the roller means to thereby present the sheet metal at a selected one of various angles to the blade of the shear; and means for lifting said ball transfer means to a position above said powered roller means to separate said sheet metal from said roller means for reorientation upon said ball transfer means,

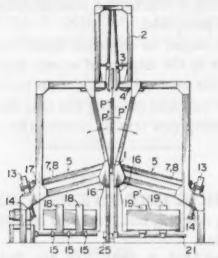
said ball transfer means being arranged in spaced apart rows with said rows being located transversely between each of said spaced apart roller means.

4,068,754

APPARATUS FOR PILING UP PLATE-SHAPED ARTICLES

Toshinori Hirata, Yoshiki, and Masamitu Yamada, Nei, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,913
Claims priority, application Japan, Mar. 14, 1975, 50-30753
Int. Cl.[2] B65G *57/06*
U.S. Cl. 198—422 **6 Claims**



1. An apparatus for handling and stacking electrodeposited metal plates, comprising:

movable conveyer means adapted to have said plates supported and stacked thereon;

plate receiving means positioned above said conveyer means for initially receiving said plates thereon and then depositing said plates on said conveyer means, said receiving means when in a plate receiving position having means defining an upwardly facing support surface which is inclined at a small angle with respect to the horizontal, said last-mentioned means permitting slidable movement of a plate along said surface toward the lower end of said receiving means, and stop means associated with said receiving means for holding the plate on said receiving means in a selected position;

said receiving means including a pair of substantially identical receivers positioned in side-by-side relationship, and means swingably mounting said receivers for swinging movement in opposite rotational directions between said plate receiving position and a lowered position which permits the plate on said receiving means to be dropped onto said conveyer means;

chute means disposed on opposite sides of said conveyer means and extending along a direction parallel to the direction of movement of said conveyer means, said chute means causing the plates as deposited from said receiving means onto said conveyer means to be positionally aligned one above the other in a direction which is perpendicular to the direction of movement of said conveyer means, whereby said chute means cooperates with the side edges of said plates for guiding same into the proper position; and

adjusting means associated with the conveyer means and cooperating with the front and rear edges of said plates for positioning the stacked plates in aligned relationship in a direction which is substantially parallel to the direction of movement of said conveyer means;

said adjusting means including front and rear vertically elongated adjusting members which are horizontally spaced apart in the direction of movement of said conveyer means and are positioned for respectively cooperating with the front and rear edges of the stacked plates, said adjusting members having the lower ends thereof disposed adjacent said conveyer means, said lower ends being pivotally supported so that said adjusting members are swingably movable in a vertical plane which extends parallel with the direction of movement of said conveyer means, said adjusting members being swingably movable between a normal position wherein the adjusting members project upwardly and are slightly inclined outwardly away from the vertical and away from the stacked plates and an alignment position wherein the adjusting members project vertically upwardly for causing accurate alignment of the stacked plates along the direction of movement of said conveyer means, said adjusting members when in said normal position acting as upwardly projecting diverging guides for causing each plate as dropped from said receivers to be approximately aligned with the stack along the direction of movement of said conveyer means;

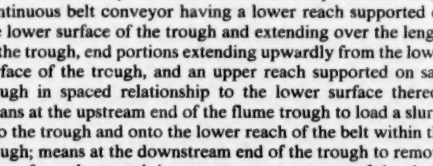
said adjusting means including means for sensing the dropping of each said plate from said receivers onto said conveyor means and for simultaneously swinging said adjusting members in opposite rotational directions toward one another into said alignment position for causing each plate to be individually accurately aligned on the stack, said adjusting means also including means for causing vertical swinging movement of said front adjusting member into a lowered substantially horizontal position after a preselected number of plates have been stacked to permit substantially horizontal movement of the stack by said conveyer means whereby said stack passes over said front adjusting member when it is in said lowered position.

4,068,755

WET BELT CONVEYOR

David M. Parkes, Calgary, and John D. Shaw, Fernie, both of Canada, assignors to Kaiser Resources, Limited, Vancouver, Canada

Filed July 22, 1976, Ser. No. 707,811
Claims priority, application Canada, Apr. 6, 1976, 249696
Int. Cl.[2] B65G *15/04*
U.S. Cl. 198—557 **7 Claims**



1. A conveyor for use in a mine to convey a slurry of water and heavy aggregate over runs of long distance within the mine and of insufficient grade to enable effective gravity flow within a fixed flume, said conveyor comprising a flume trough having upstream and downstream ends and a generally flat lower surface, said trough extending over the length of said run at substantially the same downward slope as said run; a continuous belt conveyor having a lower reach supported on the lower surface of the trough and extending over the length of the trough, end portions extending upwardly from the lower surface of the trough, and an upper reach supported on said trough in spaced relationship to the lower surface thereof; means at the upstream end of the flume trough to load a slurry into the trough and onto the lower reach of the belt within the trough; means at the downstream end of the trough to remove slurry from the trough in response to movement of the slurry

toward the downstream end; and means to drive the belt conveyor to continuously move the lower reach and any aggregate supported thereon from the upstream end to the downstream end of the trough whereby heavy aggregate which settles out of the slurry is carried by the lower reach of the belt conveyor, while water and suspended aggregate is conveyed in the trough through the influence of gravity and the movement of the lower reach conveyor belt and aggregate supported thereon.

4,068,756

CONVEYOR WITH ENDLESS CHAIN

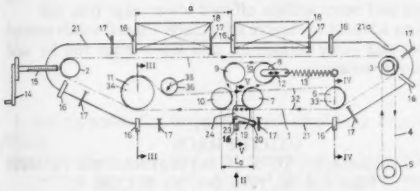
Horst Loewenthal, Tiengen, Germany, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Nov. 18, 1976, Ser. No. 743,141

Claims priority, application Switzerland, Nov. 24, 1975, 15216/75

Int. Cl.² B65G *19/24*

U.S. Cl. 198—653 **8 Claims**



1. In a conveying device including an endless main chain, a plurality of first sprockets around which the chain is guided, the sprockets being arranged to cause the chain to travel along a path having a first portion of adjustable length and presenting a gap, and a second portion defining a loop of adjustable length and extending between the edges of the gap, the first portion and the gap together defining a conveying path and the loop being located out of the conveying path, a plurality of carriers arranged to be driven by the chain along the conveying path and spaced at uniform intervals along the conveying path, and means for adjusting the length of the loop, in order to vary the length of the conveying path to permit a change in the spacing between carriers, the improvement wherein: said device comprises auxiliary conveyor means disposed for conveying said carriers across the gap in said conveying path, and transfer means for transferring said carriers from driving association with said chain to said auxiliary conveyor ahead of said gap and returning said carriers to operative association with said chain beyond said gap; said auxiliary conveyor means comprise an endless auxiliary chain provided with carrier-engaging pins projecting laterally from said auxiliary chain, a respective pin being connected to each link of said auxiliary chain, and a plurality of auxiliary sprockets around which said auxiliary chain is guided, said auxiliary sprockets being arranged to travel along a path having a portion which extends parallel to part of the first portion of said main chain and across said gap, said auxiliary chain being disposed to one side of said main chain with said pins projecting toward said main chain; said main chain is provided with carrier-engaging pins projecting laterally from said main chain toward the side at which said auxiliary chain is disposed; said carriers are provided with means arranged to be engaged by adjacent pins on either of said chains; and said transfer means present guide surfaces acting on said carriers to shift each said carrier at a location ahead of said gap from engagement with pins on said main chain to engagement with pins on said auxiliary chain, and at a location beyond said gap from engagement with pins on said auxiliary chain to engagement with pins on said main chain.

4,068,757

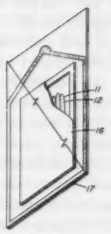
CHITIN DERIVED POWDER IN STERILE SURGICAL ELEMENT PACKAGE

Donald James Casey, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 3, 1976, Ser. No. 738,501

Int. Cl.² A61L *17/02*; A41D *19/00*

U.S. Cl. 206—363 **7 Claims**



1. A sterile surgical element package comprising

a strippable laminate container having therein

a surgical element of natural or synthetic rubber; having on the surface of said element in a small but lubricity imparting quantity;

a finely divided biodegradable powder consisting essentially of

an enzymatically degradable form of poly(N-acetyl-D-glucosamine) selected from the group consisting of poly[N-acetyl-6-0-(carboxymethyl)-D-glucosamine], poly[N-acetyl-6-0-(2'-hydroxyethyl)-D-glucosamine], poly[N-acetyl-6-0-(ethyl)-D-glucosamine], and poly(N-acetyl-D-glucosamine) itself

whereby in surgical use, any of the lubricity imparting powder which is transferred into a wound is readily absorbed by living tissue without adverse side effects.

4,068,758

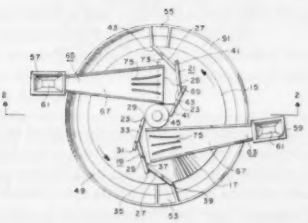
FEED SYSTEM FOR A CONOIDAL SOLIDS SEPARATING SYSTEM AND METHOD OF SEPARATING

Yahia A. K. Abdul-Rahman, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 749,589, Dec. 10, 1976. This application Dec. 13, 1976, Ser. No. 749,638

Int. Cl.² B07C *9/00*

U.S. Cl. 209—112 **14 Claims**



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which tend to slide down an inclined surface comprising:

a. a conically-shaped member with its apex pointing up, said conically shaped member being adapted to rotate about its vertical axis and having an outer surface inclined from horizontal at an angle at least as great as the static roll angle of the spherically-shaped solids and less than the

static slide angle of the irregularly-shaped solids, said outer surface having a circular-shaped lower edge rim;

b. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids through an opening onto an upper part of an inclined spreader chute;

c. said inclined spreader chute having a bottom surface, a lower end and an upper end and being adapted to receive said mixture from said supply means and to pass said mixture from said supply means off said lower end onto an impingement area of said outer surface of said conically-shaped member, said inclined spreader chute having its upper end outside the periphery of said lower edge rim and its lower end inside said periphery, said bottom surface being inclined from horizontal along its longitudinal axis and being substantially parallel to horizontal along its lateral axes, said bottom surface being wider at said lower end than it is at said upper end and being substantially wider at said lower end than the width of said opening through which said mixture is fed by said supply means onto said inclined spreader chute, said bottom surface being wide enough to allow said mixture to spread into a vertical monolayer on said bottom surface, said lower end of said bottom surface being above said outer surface of said conically-shaped member by a preselected distance, said distance being at least as great as the size of most of the solids to be separated by said system;

d. means adapted to receive spherically-shaped solids rolling from said outer surface off said lower edge rim;

e. removal means adapted to remove irregularly-shaped solids from said outer surface off said lower edge rim, and

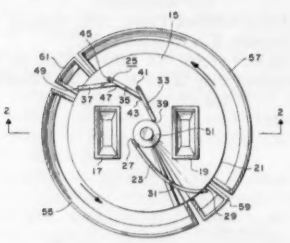
f. means adapted to receive irregularly-shaped solids removed from said outer surface off said lower edge rim by said removal means.

4,068,759

CONOIDAL SOLIDS SEPARATOR WITH SPECIAL SCRAPER AND SEPARATING METHOD

Yahia A. K. Abdul-Rahman, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,589
Int. Cl.[2] B07C 9/00
U.S. Cl. 209—112 **10 Claims**



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which tend to slide down an inclined surface comprising:

a. a conically-shaped member with its apex pointing up, said conically-shaped member being adapted to rotate about its vertical axis and having an outer surface inclined from horizontal at an angle at least as great as the static roll angle of the spherically-shaped solids and less than the static slide angle of the irregularly-shaped solids, said outer surface having a lower edge rim, a lower surface area portion above and adjacent said lower edge rim, and a higher surface area portion above said lower surface area portion;

b. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids onto an impingement area in said higher surface area portion of said outer surface;

c. a sectionalized removal means having at least a first and a second section, said sectionalized removal means adapted to coact with rotation of said conically-shaped member and movement of irregularly-shaped solids with said conically-shaped member to move said irregularly-shaped solids in a path extending across said higher and said lower surface area portions and terminating near said lower edge rim, said path having at least three component directions, said component directions being downwardly with respect to the apex of said conically-shaped member, outwardly with respect to the vertical axis of said conically-shaped member, and circumferentially with respect to said supply means and to the perimeter of cross-sectional planes perpendicular to the vertical axis of said conically-shaped member, said path having essentially only a circumferential component direction at at least one point, said at least one point being between two parts of said path having said three component directions, and the remaining portions of said path having at least said three component directions;

d. means adapted to receive spherically-shaped solids rolling from said outer surface off said lower edge rim, and

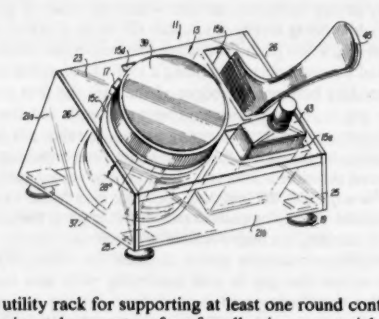
e. means adapted to receive irregularly-shaped solids moved from said outer surface off said lower edge rim by said removal means.

4,068,760

UTILITY RACK

Harvey C. Johnson, Jr., 315-17 N. 2nd St., Richmond, Va. 23219

Filed Apr. 30, 1976, Ser. No. 681,938
Int. Cl.[2] A47B 73/00
U.S. Cl. 211—74 **14 Claims**



1. A utility rack for supporting at least one round container on a horizontal support surface for allowing a material to be easily scooped from said at least one round container without thereby rotating said container, said rack comprising a solid transparent plastic frame including solid sidewalls, an open bottom, and a flat top wall having receiving openings therein, said top wall forming an angle of between 20° and 45° with the horizontal when said rack is supported on said horizontal support surface, said rack further comprising a plurality of compartments positioned on the inside of said rack at each of said top-wall receiving openings, to receive and hold said items inserted into said receiving openings, said compartments being attached to said top wall and having solid, transparent plastic side-surface members which extend into said rack at an angle of between 20° and 45° with the vertical so that said compartments extend into said rack substantially perpendicularly to said top wall, said compartments further including solid bottom surface members each being shaped to form drainage openings in the lower-most corners of said compartments, at least one of said compartments having a round cross-sectional shape, to hold said at least one round container said rack further including a separate wedge for wedging between the exterior surface of said round container and the interior surface of said compartment to inhibit rotation of said round container

relative to said rack, said rack also defining a means for engaging said wedge and thereby inhibiting rotation of said wedge relative to said rack.

4,068,761
APPARATUS FOR SUPPORTING AND DISPLAYING PLANTS

James H. McCarthy, 103 W. Rustic Lodge, Minneapolis, Minn. 55409

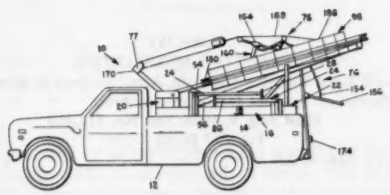
Filed Aug. 30, 1976, Ser. No. 718,592
Int. Cl.² A47G 7/00
U.S. Cl. 211—134 **3 Claims**

1. An apparatus for supporting and displaying plants comprising:
an upstanding elongated post member with means for anchoring the same at the top and the bottom and having a plurality of holes formed therein,
at least one plant supporting platform having a connecting dowel means on one end to be received in a selected hole, and
anchoring means radially offset from the selected hole and connecting said platform and said post for securely holding said dowel in the selected post hole to prevent rotation thereof.

4,068,762
PICKUP TRUCK DERRICK

Dwight Clinton Kennard, Jr., and James Clinton Kennard, both of 3830 Incochee Trail, Mich. 49684

Filed Sept. 11, 1975, Ser. No. 612,296
Int. Cl.² B66C 23/06
U.S. Cl. 212—49 **25 Claims**

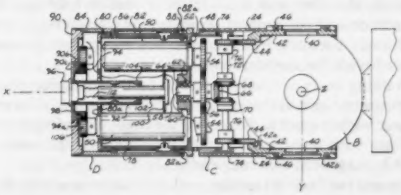


1. A collapsible boom and derrick hoist assembly removably mountable on a vehicle, comprising:
a base frame adapted for mounting on a vehicle;
a derrick frame supported on said base frame for movement from a collapsed, transporting position to an erected operating position and including a leg pivotally connected to said base frame, said derrick frame having a boom mounting plate at one end thereof;
a foldable boom assembly having a hoisting section and a counterbalance section;
hoist means on said derrick frame and said boom for hoisting articles;
trunnion means rotatably secured to said boom mounting plate and operatively connected to said boom assembly for permitting yawing and pitching motion of said boom assembly, said hoisting section and said counterbalance section pivotally connected to said trunnion means and further including means for releasably securing each of said boom assembly sections together, whereby said boom assembly may be folded along the sides of said derrick frame for transporting; and derrick frame erection means on said base frame and operatively connected to said derrick frame for moving said frame from a collapsed transporting position to an erected hoisting position, said trunnion means comprising:
a lower yoke having a base and upstanding sides;
means rotatably securing said lower yoke to said boom mounting plate;
an upper yoke having depending sides; and
a shaft hingedly connecting said upper and lower yokes through said upstanding and depending sides.

4,068,763
WRIST JOINT ASSEMBLY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Leendert Kersten, Lincoln, Nebr., and James D. Johnston, Madison, Ala.

Filed July 26, 1976, Ser. No. 708,800
Int. Cl.² B25J 3/00
U.S. Cl. 214—1 CM **13 Claims**



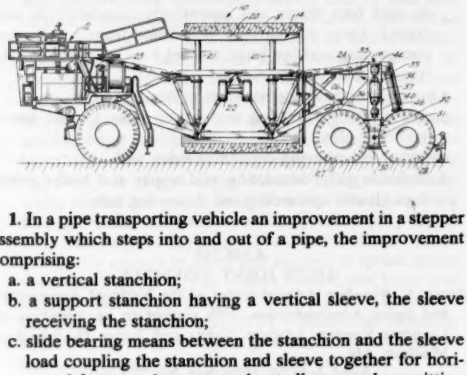
1. A wrist joint assembly for use with a mechanical manipulator arm for moving and finely positioning an end-effector carried by said wrist joint on the terminal end of said manipulator arm, said wrist joint assembly comprising:
a disk segment having an outwardly extending arm affixed to the terminal end of said manipulator arm;
a first housing member rotatably carried on said disk segment;
first drive means connected between said first housing member and said disk segment for rotating said first housing member about a first axis coinciding with the axis of said disk segment to produce a yaw motion;
a second housing member carried by said first housing member pivotable about a second axis normal to and intersecting said first axis.
second drive means connected between said second and first housings for rotating said second housing member about said second axis to produce a pitch motion, said second housing being movable in both said yaw and pitch motions;
a third housing member rotatably carried by said second housing about a third axis normal to the plane of said first and second axes so that said first, second, and third axis are mutually normal to each other and have a common point of origin;
third drive means connected between said third and second housings for rotating said third housing about said third axis to produce a roll motion; and
said third housing being movable in accordance with said yaw, pitch, and roll motions to provide for fine positioning of said end-effector carried by said third housing.

4,068,764

REAR STEPPER ASSEMBLY FOR A PIPE HANDLING VEHICLE

Frederick W. Loeber, Downey, and Louis Russo, Lawndale, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed Nov. 8, 1976, Ser. No. 739,480
Int. Cl.[2] B66C *25/42*
U.S. Cl. 214—1 PA **22 Claims**



1. In a pipe transporting vehicle an improvement in a stepper assembly which steps into and out of a pipe, the improvement comprising:

a. a vertical stanchion;

b. a support stanchion having a vertical sleeve, the sleeve receiving the stanchion;

c. slide bearing means between the stanchion and the sleeve load coupling the stanchion and sleeve together for horizontal forces and moments about all axes and permitting relative vertical motion between the stanchion and the sleeve;

d. shock absorber and load transfer means between the stanchion and the support structure for transferring vertical loads between the two and absorbing energy associated with the vertical loads;

e. a walking beam pivotally mounted on the stanchion about a transverse axis so that each end of the beam can raise and lower with respect to the pivot, the beam extending front-to-rear with respect to the line of motion of the vehicle and having front and rear ends;

f. front and rear axle set means, each axle set means including wheel means to support the stepper assembly on the front and rear ends of the walking beam, respectively; and

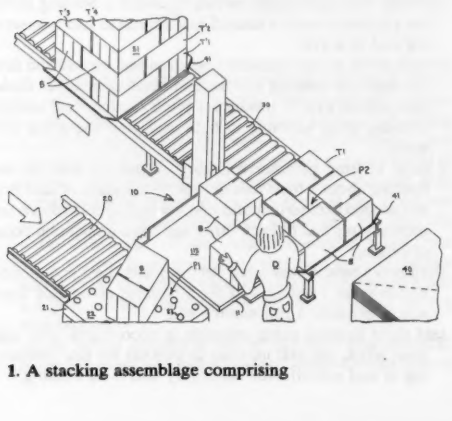
g. front and rear means to raise and lower the front and rear axle means individually while the wheel means of the remaining axle means rests on the ground.

4,068,765

STACKING OF MATERIALS

William F. Pulda, Piscataway, N.J., assignor to Vanguard Machinery Corporation, Edison, N.J.

Filed Apr. 29, 1976, Ser. No. 681,683
Int. Cl.[2] B65G *57/22*
U.S. Cl. 214—6 G **9 Claims**



1. A stacking assemblage comprising

a movable platen for supporting materials received at a first position;

a guide member transversely movable with respect to said platen against which said materials are arranged in a tier in accordance with a prescribed pattern;

means for transversely moving said guide member away from said tier;

means for shifting said platen through the position previously occupied by said guide member to overlie a second position;

said guide member being displacable in the direction of motion of said platen when said platen is shifted to overlie said second position; and

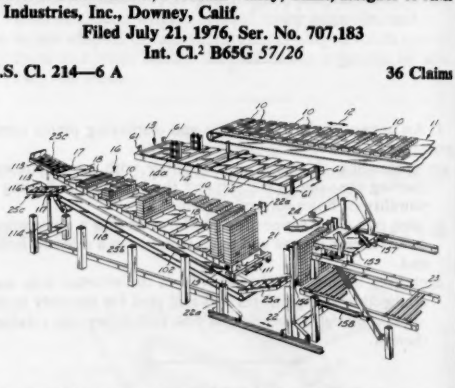
the shifting means depositing said tier at said second position as a constituent of a multi-tier stack by drawing said tier against said guide member.

4,068,766

METHOD AND APPARATUS FOR STACKING AND BLENDING BRICKS OR THE LIKE

Marvin Glenn Schmitt, Fountain Valley, Calif., assignor to AMI Industries, Inc., Downey, Calif.

Filed July 21, 1976, Ser. No. 707,183
Int. Cl.[2] B65G *57/26*
U.S. Cl. 214—6 A **36 Claims**



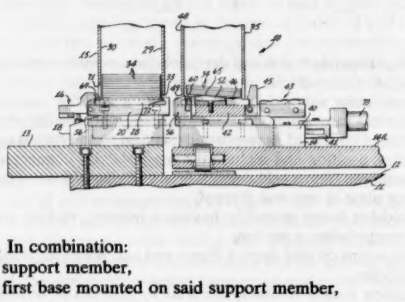
1. A brick stacker blender for forming stacks of courses of brick comprising an inclined conveyor providing a plurality of stacking surfaces progressively movable along said conveyor between stacking positions in which each surface is spaced below the preceding surface by a distance substantially equal to the height of a course of brick, and transfer means operable to position a course on each stacking surface at each stacking position.

4,068,767

TRANSFER MECHANISM

Kenneth Boyd Tippetts, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Aug. 9, 1976, Ser. No. 712,565
Int. Cl.[2] B65G *57/30*
U.S. Cl. 214—6 BA **4 Claims**



1. In combination:

a support member,

a first base mounted on said support member,

a first magazine adapted to have a plurality of substantially similar objects stacked in it,

means for removably mounting said first magazine on said first base,

a second base mounted on said support member,

a second magazine having a base and adapted to have a plurality of said objects transferred to and stacked in it, means forming an opening in the base of the second magazine,

means for removably mounting said second magazine on the second base,

cam means having a cam surface mounted on the second base, a part of the cam surface projecting through the means forming an opening in the base of the second magazine when the second magazine is mounted on the second base;

extractor means for engaging an object at the bottom of a stack of said objects in the first magazine and for inserting said object into the second magazine,

an actuator mounted on the support member and adapted to be energized,

means connecting the extractor means to the actuator, said actuator when energized causing the extractor means to cycle between a first position in which the extractor means is positioned to engage an object at the bottom of the stack of said objects in the first magazine and a second position in which an object engaged by the extractor is inserted into the second magazine,

the object being inserted into the second magazine contacting the cam surface of the cam means to forcibly move upwardly any of such objects stacked in the second magazine, whereby the object being transferred becomes the bottommost object in the second magazine.

4,068,768

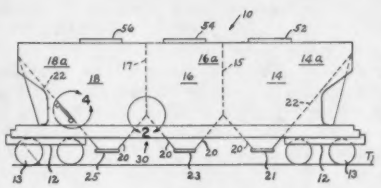
VIBRATOR BRACKET ASSEMBLY FOR HOPPERS AND RAILWAY CARS

Paul E. Hicks, Jr., Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 554,931, March 3, 1975, Pat. No. 4,039,128. This application May 28, 1976, Ser. No. 691,169

Int. Cl.² B65G *67/24*

U.S. Cl. 214—64.2 **13 Claims**



1. A railway hopper car comprising: a plurality of hoppers supported by trucks at opposite ends of the car; said hoppers comprising at least one hopper slope sheet at the lower portion thereof; at least two spaced support members adapted to extend parallel to and integrally engage, respectively, a hopper planar surface of at least one of said hoppers; said spaced support members each having a longitudinal axis; a vibrator mounting bracket extending between said support members and having first and second planar surfaces, said planar surfaces being parallel to the longitudinal axis of said spaced support members and adapted to receive a vibrator suitable for facilitating loading and/or unloading of the hopper by applying vibrational forces to the hopper; whereby reciprocating vibrational forces applied to the vibrator mounting bracket are transmitted through said spaced support members and are applied to said hopper planar surface essentially entirely as shear loads in the plane of said hopper planar surface.

4,068,769

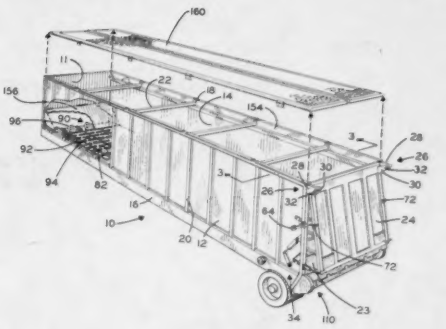
CARGO BOX

Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Fresno, Calif.

Continuation of Ser. No. 592,788, July 2, 1975, abandoned. This application May 2, 1977, Ser. No. 792,774

Int. Cl.² B60P *1/36*

U.S. Cl. 214—83.18 **22 Claims**



1. In an elongated cargo box for transporting compacted contents having a pair of substantially vertically oriented converging side walls extended between opposite ends of the box, and an inclined floor extending the length of the box, between the side walls thereof, and characterized by a first width and a first height dimension near a first end thereof, the improvement comprising:

means defining in said box at a second end thereof, a contents discharge opening of a substantially rectangular configuration disposed in a plane transversely related to the longitudinal plane of symmetry of said cargo box and characterized by a second width and a second height dimension greater than said first width and said first height dimension, movable conveyor means extended rearwardly along the surface of the floor and projected through said contents discharge opening for conveying contents beyond the limits of the box, and closure means for said opening including a closure panel of a substantially planar configuration displaceable between a contents confining configuration wherein the panel is disposed between the rearward end of said conveyor and the contents discharge opening and a contents discharge configuration wherein the panel is disposed in a rearwardly spaced relation with the opening and suspension means arranged in rearwardly spaced relation with said opening including support members extending rearwrdly from opposite sides of said opening, mounting means affixed to said panel, and coupling means pivotally coupling said mounting means to said support members in rearwardly spaced relation with said opening supporting said closure panel for mass-induced pivotal displacement from its contents confining configuration to a contents discharge configuration about a horizontal axis located in rearwardly spaced relation with the opening.

14. In an elongated cargo box for an overland vehicle, particularly suited for use in hauling refuse, characterized by a discharge opening disposed in a substantially vertical plane, the improvement comprising:

A. a closure panel for said opening continuously biased by its own mass in angular displacement away from a closed position in which said panel obstructs said opening; and

B. cantilevered suspension means for supporting said panel for angular displacement including a first pair of bracket arms mounted on the upper portion of said box and projected rearwardly therefrom in mutually spaced parallelism, a second pair of bracket arms mounted on the upper

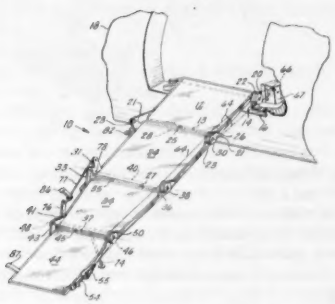
portion of said closure panel and projected rearwardly therefrom in contiguous relation with said first pair of bracket arms, and means disposed in displaced relation with said discharge opening pivotally connecting the extended end portions of said first pair of arms to the extended end portions of said second pair of arms for supporting said panel in pivotal suspension for mass-induced angular displacement about an axis arranged in spaced relation with said discharge opening.

4,068,770

FOLDABLE INCLINED MULTI-SECTION RAMP ACTUATION SYSTEM

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 27, 1976, Ser. No. 690,637
Int. Cl.[2] B60P *1/00*
U.S. Cl. 214—85 **32 Claims**



1. Foldable, articulated ramp apparatus comprising in combination:

at least three separate ramp sections foldable for storage within a vehicle and extendible therefrom, including first and second sections pivotably joined together by a first hinge mechanism for relative rotation about a first hinge axis; and a third section pivotably joined by a second hinge mechanism to the second section outboard of the first section for relative rotation about a second hinge axis;

a plurality of pulleys individually mounted at respective hinge axes for rotation thereabout;

cable anchoring means mounted on one of said sections;

cable driving means mounted inboard of said cable anchoring means relative to the vehicle; and

a cable extending about each of the pulleys and between the cable anchoring means and the cable driving means for folding and unfolding the ramp sections relative to each other.

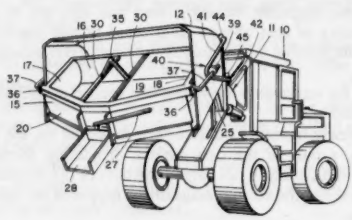
4,068,771

CARRIER BUCKET AND APPARATUS FOR REMOVABLY ATTACHING THE SAME TO A LOADER BUCKET

James Eldon Zimmerman, 600 Manatee Ave. W., Holmes Beach, Fla. 33577

Filed Oct. 18, 1976, Ser. No. 733,218
Int. Cl.[2] E02F *3/81*
U.S. Cl. 214—313 **3 Claims**

1. Apparatus for removable attachment to a loader bucket for converting the loader bucket to carry flowable material comprising a carrier bucket having upright first and second side walls, a rear wall and a front wall, and a bottom interconnecting all of said walls, said carrier bucket being formed to be received in said loader bucket, the rear wall, first and second side walls and bottom wall of said carrier bucket conforming to the shape of said loader bucket, first and second attaching means for removably securing the exterior of said first and second side walls of said carrier bucket to said loader bucket, said first and second attaching means each comprising a linkage assembly secured to a side wall of said carrier bucket adjacent the forward portion thereof and extending rearwardly therefrom, and bracket means secured to the rear wall of said loader bucket and adapted to receive the rear portion of said linkage means.

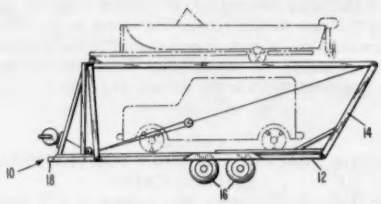


4,068,772

DUAL LOAD TRAILER

C. R. Prudhomme, P.O. Box 219, Blanco, Tex. 78606

Filed Jan. 12, 1977, Ser. No. 758,765
Int. Cl.[2] B60P *3/08*
U.S. Cl. 214—505 **9 Claims**



1. A dual load trailer comprising

a trailer base having wheel means thereon and adapted to carry a first load thereupon;

a carrier frame mounted on the trailer base;

a load platform of the carrier frame movable between a carrying and a loading position and adapted to carry a second load;

front and rear leg means on the carrier frame connecting the load platform to the trailer base and pivotally connected to both the load platform and the trailer base, the rear leg means being longer than the front leg means and being tilted rearwardly to bias the load platform to pivot rearwardly to lower the load platform to its loading position; and

holding means to secure the load platform against rearward movement to hold the load platform parallel to the trailer base in its carrying position.

4,068,773

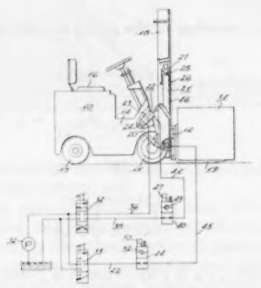
LIFT VEHICLE WITH FAIL-SAFE OVERLOAD PROTECTIVE SYSTEM

Terry R. Downing, Hazel Crest, Ill., and Warren E. Herwig, Wind Lake, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 3, 1975, Ser. No. 564,719
Int. Cl.[2] B65E *47/00*; G08B *21/00*
U.S. Cl. 214—674 **8 Claims**

1. A fail-safe overload protective system for a vehicle having a frame, load supporting means including a shiftable load support on said vehicle, power means affixed to said frame and operable to shift said load support on said vehicle and includ-

ing a load carrying member which is subjected to the forces exerted by said power means and resists the tilting moment acting on said vehicle as a result of the position of said load support on said vehicle, sensor means including a plurality of strain gages mounted on said load carrying member and arranged in an electrical bridge for detecting the mechanical strain in said load carrying member and generating an electrical strain signal whose magnitude varies as a function of said mechanical strain, means for applying a first potential to said electrical bridge, a differential amplifier having its inputs coupled across a diagonal of said bridge for raising the level of said strain signal and being coupled to said bridge through electrical leads, whereby said bridge may be inherently unbalanced due to the weight of the unloaded load support acting on said load carrying member and consequently the output voltage of said differential amplifier may vary, comparator means for deriving a trip signal when the output voltage from said differ-



ential amplifier exceeds a predetermined magnitude when said load support carries a load, disabling means responsive to said trip signal for inhibiting said power means from shifting said load support in a direction to increase the tilting moment acting on said vehicle, fail safe means for providing an unbalance effect on said differential amplifier if one of said electrical leads is open, said fail safe means including voltage divider means having one portion of said bridge and a portion of one of said electrical leads as a part thereof for applying a second potential to said system, said differential amplifier being responsive to one of said electrical leads being open to cause said output voltage of said differential amplifier to exceed said predetermined magnitude to thereby actuate said disabling means, and potentiometer means for selectively applying a variable unidirectional voltage to one input of said differential amplifier to zero the voltage output therefrom when said load support is unloaded and said second potential is being applied to said system.

4,068,774

MATERIAL HANDLING IMPLEMENT

Silas E. Howell, Jr., Rte. 1, Garland, N.C. 28441

Filed Nov. 8, 1976, Ser. No. 740,058

Int. Cl.[2] E02F *3/82*

U.S. Cl. 214—766 **3 Claims**

1. A material handling implement adapted to be connected to and powered by a three-point hitch assembly of a conventional tractor, said material handling implement comprising:

a. a main frame structure including a single elongated beam member having front and rear ends;

b. connecting means operatively associated with said elongated beam member for connecting said beam member to the three-point hitch assembly of said tractor such that when connected to said tractor said elongated beam member extends generally rearwardly from said tractor and may be powered up and down by the tractor's three-point hitch assembly, said connecting means including means for directly pivotly connecting said front end of said beam member to an upper central hitch point of said three-point hitch assembly and a pair of connecting links connected to respective lower left links forming a part of said three-point hitch assembly and extending generally upwardly therefrom where they connect to elongated beams about an intermediate point between said front and rear ends thereof;

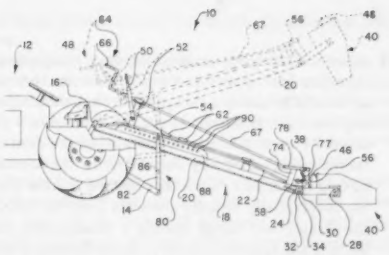
c. a transverse support member secured to the rearward end of said elongated beam member and including two laterally spaced apart leaf members projecting from said transverse support members;

d. a shovel assembly secured to said transverse support member disposed about the rear end of said elongated beam member;

e. said shovel assembly including a generally U-shaped yoke pivotably mounted to said leaf members projecting from said transverse support member, and a shovel pivotably mounted about a transverse axis within said U-shaped yoke and movable between a filling position and a dumping position;

f. said shovel including counter balancing means strategically associated with said shovel relative to said shovel's axis of rotation for causing said shovel to automatically return from said dumping position to said filling position in response to said shovel being emptied;

g. said shovel further including an anchor plate having a generally curved shaped caming surface with an opening therein with said anchor plate being secured about the rear side of said shovel and which generally abuts against shovel stop means forming a part of said shovel assembly when said shovel is disposed in said filling position;



h. shovel blocking means normally engaged with said shovel and operative to maintain said shovel in said filling position, said shovel locking means including a locking pin axially movable within a sleeve stationarily mounted to said shovel assembly with said locking pin being spring biased so as to normally extend through said opening formed in said anchor plate for locking said shovel in said filling position;

i. actuating means operatively connected to said shovel locking means for effectively disengaging said locking pin from said opening formed in said anchor plate such that said shovel may move from said filling position to said dumping position due to the presence of material within said shovel, said actuating means for disengaging said locking pin including a lever pivotably mounted about said elongated beam about a forward portion thereof in reach of an operator stationed on said tractor, and a cable operatively interconnected between said lever and said locking pin; and

j. manually actuated control means associated with said material handling implement for adjusting and varying the angle of said shovel assembly relative to said elongated beam member such that the digging angle of said shovel may be adjusted for various working conditions, said manually actuated control means including a hand crank rotatively mounted about said elongated beam member and positioned thereon about the front area thereof in reach of the tractor operator and a worm gear rotatively

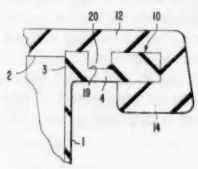
mounted in a collar stationarily secured relative to said elongated beam member wherein said worm gear is operatively connected between said hand crank and said shovel assembly such that the actuation of said hand crank causes said shovel assembly and the shovel thereof to be angularly adjusted relative to said elongated beam member.

4,068,775

SEALABLE CONTAINER DEVICE

Guy V. Palmer, Inkster, Mich., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 30, 1976, Ser. No. 755,796
Int. Cl.[2] B65D *41/06*
U.S. Cl. 215—331 **2 Claims**



1. A sealable canning container device, comprising

a container having an open top with a rim therearound, a substantially annular flange extending substantially radially from the container at the rim thereof in a plane substantially perpendicular to the axis of the container, said flange being integrally formed with the container and having a plurality of notches formed therein and extending substantially radially inwardly from the outer edge of the flange, said flange having a substantially planar top surface and tapered bottom surfaces forming a plurality of inverted inclined planes relative to the top surface, each extending from one of the notches to the next-adjacent notch in the same direction around the flange;

a lid having a plurality of lock members formed thereon in the same angular relationship as the notches of the container whereby each of the lock members is simultaneously passable through a corresponding one of the notches of the flange of the container, each of said lock members comprising an arm supported by the lid and extending substantially parallel to the lid in spaced relation below said lid in a manner whereby when the lid is positioned on the container with the lock members in alignment with the notches of the flange and the lock members are passed through the notches and the lid is turned, the arms of the lock members move into abutment with the bottom surfaces of the flange, and if the lid is further turned, said arms securely seal said lid to said container via said flange to provide a seal strong enough to preserve perishable foods for years;

a plurality of stop projections each extending from a bottom surface of the flange at a corresponding one of the notches at the area of maximum flange thickness between top and bottom surfaces; and

a circular groove formed in the top surface of the flange in spaced relation with the notches thereof and a corresponding circular protrusion extending from the bottom of the lid for fitting in the groove and sealing the container.

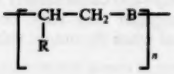
4,068,776

PLASTISOL COMPOSITION AND CONTAINER CLOSURE GASKET MADE THEREFROM

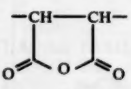
Walter R. Wszolek, Sykesville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 563,018, March 28, 1975, Pat. No. 4,020,966. This application Jan. 3, 1977, Ser. No. 756,143
Int. Cl.[2] B65D *45/10*; C08L *35/00*; C08K *5/04*
U.S. Cl. 215—349 **5 Claims**

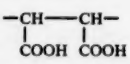
1. A plastisol composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



wherein B is a member of the group consisting of

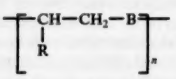


and

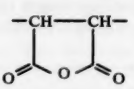


R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of a polyol plasticizer.

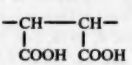
2. A container closure comprising a cap having deposited therein a resinous mass functioning as a gasket to seal the container when the closure is in sealing relationship with the container, said resinous mass comprising a fluxed plastisol of a composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



wherein B is a member of the group consisting of



and



R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of a polyol plasticizer.

4,068,777

EXPANSIBLE BOTTOM STRUCTURE FOR FIBERGLASS REINFORCED PLASTIC TANKS

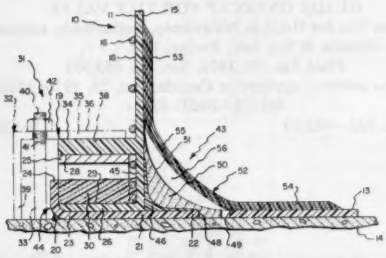
Frederick H. Humphrey, Markham, Canada, and James J. Jarvis, Snyder, N.Y., assignors to Metal-Cladding, Inc., North Tonawanda, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,067
Int. Cl.[2] B65D *25/24*
U.S. Cl. 220—1 B **7 Claims**

1. An upstanding fiberglass reinforced plastic tank adapted

to receive and store a fluid exposed to atmospheric pressure, said tank having a bottom resting on a support and having an annular side wall structure, the head of a fluid stored within said tank exerting hydrostatic pressure on said side wall structure which urges said side wall structure to expand outwardly in a radial direction, wherein the improvement comprises:

movable means forming a slidable foot at a lowermost portion of said side wall structure for permitting radial expansion of a lower portion of said side wall structure due to hydrostatic pressure of a stored fluid, said slidable foot including a portion having a surface resting on and unattached to said support and substantially coplanar with the



lower surface of the tank bottom, said foot being separated from said tank bottom; and

joining means interconnecting said tank bottom and side wall structure, said joining means including annular batten means formed of fiberglass reinforced plastic material and having an upper portion bonded to said side wall structure, having a lower portion bonded to said tank bottom, and having an intermediate transitional portion adapted to flex during such radial expansion of said side wall structure;

whereby, during such radial expansion, said slidable foot may slide outwardly along said support without significant deformation of its original shape.

4,068,778

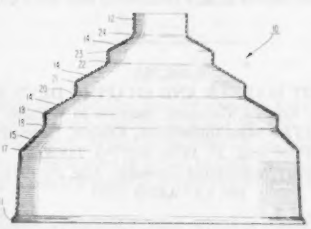
VOID CAP

William Wilson, 716 Scott St., Stroudsburg, Pa. 18360

Filed Mar. 11, 1976, Ser. No. 665,976

Int. Cl.[2] B65D *7/42*

U.S. Cl. 220—66 **10 Claims**



1. A void device for a container, said cap having a rigid generally conical shape and having an opening at each end, the larger end of said cap being of sufficient size to be coupled to an open end of a container that contains material and the smaller end being for discharge of the material, said larger end including an axis, the inner surface of the side walls of said cap being comprised of a plurality of side wall portions that are parallel to said axis and a plurality of angular side wall portions, some of said angular side wall portions being disposed at an angle of about 45° relative to said axis, some of said side wall portions being disposed at an angle of about 60° relative to said axis, said angular portions being disposed between said annular portions with said portions angled at 60° being further from said large end than said portions angled at 45° and the juncture of said wall portions is rounded so that said angled side wall portions and said parallel side wall portions cooperate with each other and with said rounded junctures to disrupt the flow of material and cause it to change direction thereby intermixing it as it is discharged from the container through said void cap.

4,068,779

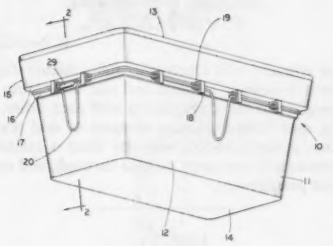
FOAMED PLASTIC COOLER AND HANDLE COMBINATION

Michael P. Canfield, 7516 Placing Road, Indianapolis, Ind. 46226

Filed Dec. 1, 1975, Ser. No. 636,633

Int. Cl.[2] B65D *25/28*

U.S. Cl. 220—94 R **3 Claims**



1. A foamed plastic cooler and handle combination which comprises:

a foamed plastic cooler having an upwardly extending side wall, the exterior of the side wall including a downwardly facing shoulder extending at least partially around the side wall, the side wall having a first portion lying immediately below the shoulder, the first portion comprising four flat surfaces intersecting at approximately right angles;

frame means for engaging the downwardly facing shoulder, said frame means including a pair of apertures located along each of the four flat surfaces, said frame means including a support member which extends perimetrically about the foamed plastic cooler adjacent the downwardly facing shoulder; and

handle means attached to said frame means for permitting said foamed plastic cooler to be lifted, said handle means comprising a flexible member, the flexible member of said handle means being continuous in passing through each of the pair of apertures of said frame means.

4,068,780

ELECTROTHERMALLY ACTUATED FLUID DISPENSING DEVICE

Charles R. Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605

Filed June 3, 1976, Ser. No. 692,455

Int. Cl.[2] F17C *13/08*

U.S. Cl. 222—5 **23 Claims**

1. A fluid dispensing device for use with a pressurized container, the device comprising;

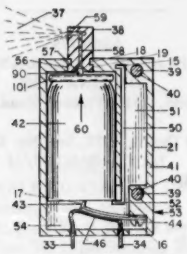
a. a body member;

b. means for supporting said pressurized container in said body member, wherein said pressurized container has a fluid-dispensing element adapted to release fluid under pressure from said pressurized container when actuated;

c. dispensing element actuating means in said body member adapted to engage and actuate said fluid-dispensing element of said pressurized container;

d. a passageway in said dispensing element actuating means having an entry section at one end thereof;

e. an electrothermal actuator strip mounted in said body member moving between a quiescent position and an actuation position, in said quiescent position said fluid-dispensing element of said pressurized container and said dispensing element actuating means are separated from each other, said electrothermal actuator strip moving to said actuation position upon the application of an electric



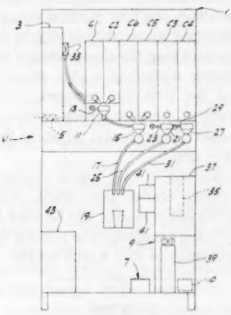
current whereby said electrothermal actuator strip forces said fluid-dispensing element and said dispensing element actuating means into engagement with each other, thereby causing said fluid-dispensing element of said pressurized container to be actuated, whereby fluid is released from said pressurized container to pass through said entry section and passageway.

4,068,781

HOT AND COLD BEVERAGE VENDOR

Bartholomew L. Toth, St. Louis, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,634
Int. Cl.[2] B67D *5/06*
U.S. Cl. 222—52 **1 Claim**



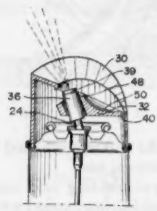
1. A vendor for hot and cold beverages having a hot water tank, an electrical heater for heating water in the tank to constitute a supply of hot water for hot beverages, a pump for pumping water for cold beverages, an electric motor for driving the pump, a refrigeration system for cooling water for cold beverages including a compressor and an electric motor for driving the compressor, means for supplying current to the heater upon a demand for heating water in the tank, means for supplying current to the pump motor upon a demand for water for cold beverage, means for supplying current to the compressor motor upon a demand for refrigeration, and means responsive to operation of one of said pump and compressor motors while there is a demand for heating water in the tank to reduce the current supplied to the heater so as to limit the total current drawn by the heater and the two motors, said current-reducing means being responsive to operation of either the pump motor or the compressor motor, the means for supplying the heater with current comprising a line connected across a source of voltage, having a thermostatic switch connected therein responsive to the temperature of water in the tank, and said current-reducing means comprising a set of normally closed contacts in said line, means for opening said contacts in response to operation of either the pump motor or the compressor motor, and a shunt around said contacts having current limiting means therein, the means for supplying the heater with current supplying alternating current, and said current limiting means being a diode for halving the current drawn by the heater when said contacts are open.

4,068,782

GLADE OVERCAP FOR TILT VALVE

Johannes Van der Heijden, Nieuwkoop, Netherlands, assignor to S. C. Johnson & Son Inc., Racine, Wis.

Filed Jan. 29, 1976, Ser. No. 653,331
Claims priority, application Canada, Oct. 23, 1975, 238204
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.13 **10 Claims**



1. In a pressurized package of the type having a product reservoir and a tilt-actuatable valve with tiltable valve stem extending from said reservoir and forming an axis line, said stem having a product release orifice substantially at its end, the improvement comprising an actuator-overcap including a main portion adjacent said reservoir and a finger-depressible tab portion hinged at one end to said main portion and having its other end adjacent said stem, said tab portion having a finger-contact surface between said hinged end and said other end, said actuator-overcap defining an access opening for said stem to expose said product release orifice, said opening normally being substantially centered on said axis and being larger than said stem such that said stem is freely received therein as said tab is axially depressed, said opening moving off center with respect to said axis line as said tab is axially depressed such that said stem is tilted by a wedging action of said tab in which said tab moves axially relative to said stem during said depression.

4,068,783

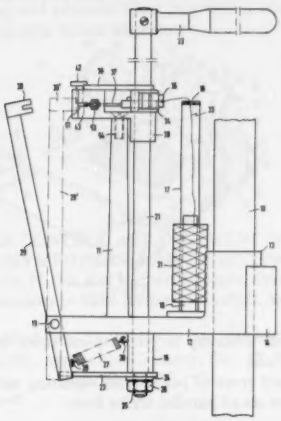
SKIRT MARKER AND SHAPING DEVICE

Erwin Maier, Kongen, Germany, assignor to Wilhelm Maier & Sohne UNITAS-Maschinenfabrik, Kongen, Germany

Filed Aug. 27, 1976, Ser. No. 718,377
Claims priority, application Germany, Aug. 30, 1975, 2538751
Int. Cl.[2] A41H *9/00*
U.S. Cl. 223—1.1 **28 Claims**

1. Apparatus for shaping and marking a skirt with inserted threads, comprising a vertical support, a pressure plate mounted on said support for holding said material, a material deflector pivotally mounted with respect to said support and adapted to deflect said material against said plate, said pressure plate and said material deflector being formed with cooperating opposed faces for folding said material and with a needle guide for passage of a needle through said folds, a needle, a needle carrier movably mounted on said support for movement carrying the needle into and out of said needle guide, means for feeding a thread to said needle, a clamping means arranged at the rear end of said needle guide to grasp said thread, cutting means located at the front end of said needle guide to cut said

thread and actuating means for sequentially operating said material deflector, needle carrier, clamping means and cutting means to effect insert of thread of defined length in the folds of said material.



4,068,784

HOLSTER AND SHOULDER-HARNESS ASSEMBLY

Robert Angell, 8 Centre Market Place, New York, N.Y. 10013

Filed Aug. 21, 1975, Ser. No. 606,591
Int. Cl.² F41B *13/04*
U.S. Cl. 224—2 B **4 Claims**

1. A holster and shoulder-harness assembly for suspending a pistol in an invested position adjacent an arm of a wearer whereby it is free to swing and thereby accommodate itself to the contour of the wearer as well as to the demands imposed on the holster when the pistol is withdrawn therefrom, comprising:

A. a harness including a yoke which is loopable about a selected shoulder of the wearer, said yoke having dependent ends which extend down opposite sides of the wearer body, and a female component of a snap fastener attached to each end of the yoke, each snap fastener having in addition to said female component a male component and being directional whereby it cannot be decoupled except by a force applied in a predetermined direction at one position of the female component, and

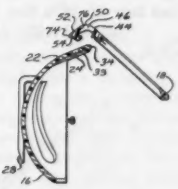
B. a holster for suspending said pistol from said harness in an inverted position so that the grip of the pistol normally protrudes from the bottom of the holster, said holster having the male components of the snap fasteners secured thereto at spaced positions to complement said female components on the ends of the yoke, said female components being rotatable relative to the male components to define pivots whereby said holster is free to swing with respect to said harness to facilitate the withdrawal of the pistol at a desired angle, said holster having a triangular formation defining a nose and an opening for receiving the pistol, said pistol being retained in said inverted position in said holster by readily releasable flap means, one of said male components being disposed adjacent said nose and the other of said male components being disposed adjacent said opening.

4,068,785

BALL HOLDER CONNECTOR

Noel G. Goudreau, Bradley, Ill., assignor to Icon American International, Inc., Kankakee, Ill.

Filed Feb. 23, 1976, Ser. No. 660,189
The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.
Int. Cl.² A63B *61/00*
U.S. Cl. 224—5 D **7 Claims**



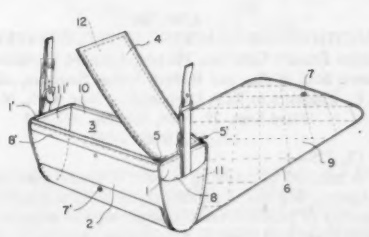
1. In a ball holder adapted for readily removably holding a ball on a person of a player having a first portion having a cavity defining a portion of a sphere less than a hemisphere, said sphere having a diameter approximately the diameter of the ball; a clip connected to the first portion for securing the ball holder to an article of clothing worn by the player; and a second portion resiliently connected to the first portion; said second portion being adapted for engagement with and retention of a ball positioned in the cavity; the improvement comprising: a first tongue connected to one of said portions, an aperture formed in said first tongue; and a second tongue connected to the other of said portions, a hook connected to said second tongue, said hook being adapted to pass through said aperture of said first tongue to engage lockingly said first tongue.

4,068,786

SHOULDER BABY BAG

Susumu Taniguchi, Tokyo, Japan, assignor to King Baby Corporation, Winston-Salem, N.C.

Filed Aug. 16, 1976, Ser. No. 714,658
Int. Cl.² A47D *13/02*
U.S. Cl. 224—6 **10 Claims**



1. A shoulder baby bag comprising: a pair of first covers having a generally inverted triangular shape and spaced apart

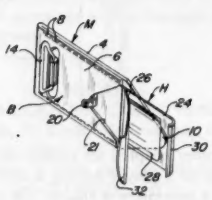
from and in opposing relation with each other; a second cover having a generally rectangular shape and stitched to the side edges of said first covers for defining a cavity with said first and second covers; a third cover having a generally rectangular shape and having one end stitched to the upper edge of one of said first covers and having its side edges attachable to the upper edges of said second cover with zippers, said third cover further having the other end extending to the upper edge of the remaining first cover and being swingable around said one end of said third cover when said side edges of said third cover is dissociated from the upper edges of said second cover; a tongue cover having a generally rectangular shape and having one end stitched to the lower portion of said second cover and the other end fastenable to said one end with a sufficient length to wrap said second cover and third cover; and a shoulder strap having ends secured to the upper portions of said first covers whereby said tongue when unwrapped serves as a bed and said first, second and third covers serve as a pillow.

4,068,787

MONEY BUCKLE

James W. Craighead, 501 Dexter St., Denver, Colo. 80220

Filed July 12, 1976, Ser. No. 704,511
Int. Cl.[2] A45C *1/04*
U.S. Cl. 224—26 E **5 Claims**



1. A money buckle for secretly carrying valuables and the like, for use with a belt having a first end which folds back upon itself for attachment to a buckle and having a plurality of spaced holes extending longitudinally from a point adjacent a second end for adjustably fastening the belt about the waist of the wearer, said buckle comprising:

an envelope-like body which has an inner and an outer wall interconnected along one end and along opposite edges to form a cavity for receiving the valuables and has a foldable safety flap for closing the opposite end to conceal the valuables;

first means adjacent said one end for releasably attaching said buckle to the first end of the belt;

second means extending from said body adjacent said opposite end releasably engagable with and extendable through said flap and further engagable with one of the of the holes in the belt for holding said flap in a closed position sandwiched between said body and said belt when said second means is in engagement with one of the holes in the belt.

4,068,788

METHOD FOR CRACKING BRITTLE MATERIAL

Nicholas Francis Gubitose, Moosic; Leonard Gawelko, Wilkes Barre, both of Pa., and Robert Joseph Satriano, Allamuchy, N.Y., assignors to RCA Corporation, New York, N.Y.

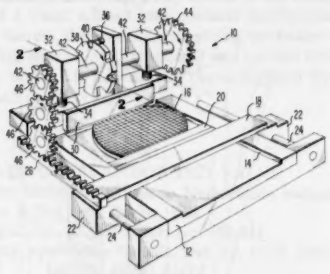
Filed Sept. 29, 1975, Ser. No. 617,632
Int. Cl.[2] B26F *3/00*
U.S. Cl. 225—1 **4 Claims**

1. A method of cracking a sheet of brittle material having two intersecting sets of parallel scribe lines, said sets enclosing a plurality of pellets thereon comprising the steps of:

supporting said sheet in a cantilever manner at a point at least one scribe line away from an edge thereof, said edge being substantially parallel with said scribe lines;

applying, by means of a shear blade, a shear force to said edge of said sheet, whereby said sheet is fractured at said one scribe line;

repeating said method until all scribe lines of one set are



fractured, whereby a plurality of rows of pellets are formed; and

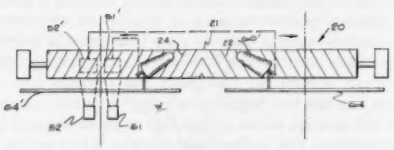
rotating said rows of pellets and repeating said method on the other set of parallel scribe lines.

4,068,789

METHOD AND APPARATUS FOR CONTROLLING A MOVING WEB

William O. Young, Jr., Spartanburg, and Mansel A. Jennings, Inman, both of S.C., assignors to Young Engineering, Inc., Spartanburg, S.C.

Filed Oct. 24, 1975, Ser. No. 625,756
Int. Cl.[2] B65H *23/02*
U.S. Cl. 226—3 **17 Claims**



1. Apparatus for controlling lateral position of a moving textile web comprising:

a. a driven roll extending across a path of travel of said moving textile web, said roll means having at least one helical element thereon to move said textile web in a lateral direction under predetermined conditions;

b. pressure applicator means located adjacent said driven roll and being actuatable under predetermined conditions to make contact with said web on said roll and cooperate with said roll to drive said web in a lateral direction while avoiding imparting any substantial axial forces on said web with respect to the direction of web travel; and

c. web detector means located along said path of travel for detecting lateral position of said web, said detector means being operatively associated with said pressure applicator means to actuate and deactuate same responsive to the lateral position of said web.

14. A method of controlling the lateral position of a moving textile web comprising the steps of:

a. feeding a textile web over a driven roll, in engagement across the width of said textile web with at least one helical element thereon;

b. sensing the lateral position of the web;

c. applying pressure on said web at said roll upon sensing a lateral misalignment of same, said pressure being applied on said web at a lateral location of same opposite the lateral misalignment in an amount insufficient to create any substantial axial force on said web with respect to the direction of web travel, whereby said web is driven later-

ally towards the location of applied pressure so long as said pressure continues; and

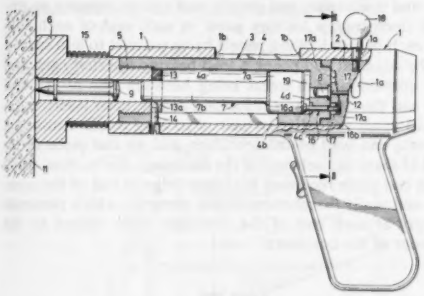
d. releasing said pressure when said web is sensed as being back in proper lateral alignment.

4,068,790

POWER CONTROL ARRANGEMENT FOR AN EXPLOSIVE POWDER-DRIVEN SETTING GUN

Helmut Osterle, Nofels, and Herbert Rangger, Frastanz, both of Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Oct. 22, 1976, Ser. No. 735,093
Claims priority, application Germany, Oct. 27, 1975, 2548014
Int. Cl.[2] B25C *1/14*
U.S. Cl. 227—8 10 Claims



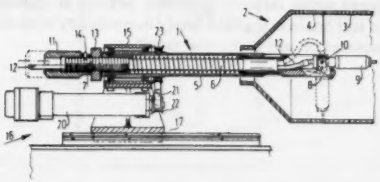
1. Explosive powder-driven setting gun comprising a casing forming an axially extending first bore having a muzzle end and a rear end spaced axially from the muzzle end, a piston guide axially displaceably mounted in the bore in said casing, said piston guide having a muzzle end and a rear end spaced axially from the muzzle end with the muzzle end of said piston guide oriented relative to one another in the same manner as the muzzle end and rear end of the bore in said casing, said piston guide forming a second bore with the axis thereof disposed in substantially parallel relation with the axis of the first bore, an axially elongated driving piston axially displaceable through the second bore in said piston guide between the rear end and muzzle end thereof, said driving piston having a forward end closer to the muzzle end of said piston guide and a rearward end closer to the rear end of said piston guide, a locking piece located within said casing at the rear end of the bore rearwardly of said piston guide, an axially displaceable stop pin mounted in the rear end of said piston guide and having the axis thereof disposed in parallel relation with the axis of said driving piston, said stop pin having a front end facing toward the muzzle end of said piston guide and a rear end facing in the opposite direction, wherein the improvement comprises that said locking piece being axially stationarily mounted in said casing, said stop pin being axially displaceable relative to said piston guide for locating the front end of said stop pin within the second bore in said piston guide to limit the position of the rear end of said driving piston relative to the rear end of said piston guide, and a supporting element for the rear end of said stop pin, said supporting element adjustably mounted in said locking piece and arranged for varying the extent to which said stop pin extends into the second bore in said said piston guide.

4,068,791

HOLDER FOR A WELDING HEAD

Christiaan Gustaaf Adolf Scholtus, Oudorp; Willebrordus Cornelis Hoeboer, Amsterdam, and Antonius Ruiter, Schagen, all of Netherlands, assignors to Ultra-Centrifuge Nederland N.V., The Hague, Netherlands

Filed Dec. 12, 1975, Ser. No. 640,389
Claims priority, application Netherlands, Dec. 23, 1974, 7416810
Int. Cl.[2] B23K *37/02*
U.S. Cl. 228—45 3 Claims



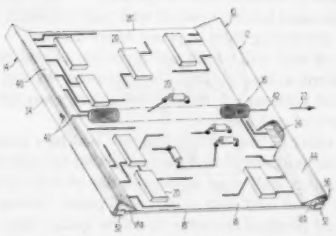
1. A welding head positioner for carrying out welds on the inner side of a substantially closed, narrow body which comprises a carriage provided with a mounting, an elongated, motor-driven cantilever sleeve-like member rotatably positiond within said mounting, a hollow, rod-like member slidably disposed within said sleeve-like member, a frame consisting of two lengthwise side-by-side arranged flats fixed to the cantilever end of said sleeve-like member and pivotly supporting therebetween a holding member having on opposite sides thereof protruding stub-like pins turning in holes provided in said flats, said holding member fixedly carrying within it a welding head, pin and slot linkage means acting between said rod-like member and holding member, said linkage means serving to pivot said holding member responsive to axial, sliding movement of said rod-like member, the welding head being pivotable from an axially directed position to a radially directed position by the axial displacement of the rod-like member inside of the sleeve-like member.

4,068,792

DEVICE FOR PROTECTING THE EDGE CONNECTORS OF PRINTED CIRCUIT BOARDS DURING WAVE SOLDERING

Charles Fulton Dixon, Drexel Hill, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 28, 1977, Ser. No. 791,871
Int. Cl.[2] B23K *3/00*
U.S. Cl. 228—57 7 Claims



1. A device for protecting the edge contacts of a printed circuit board during wave soldering comprising:

a pair of spaced-apart allochirally disposed sections;

tensioning means coupling said sections to each other;

each of said sections having a substantially right triangular cross-sectional geometry, the sides of the right angle portion of each of said sections defining respectively a vertical member and a horizontal member, the length of

said horizontal member being abbreviated to provide an opening into said section between its extremity and that of a third side representing the hypotenuse of said triangular geometry;

said sections being capable of being pivoted from their initial positions about horizontal axes through the respective vertices of their right angles thereby permitting the friction-free insertion of the respective opposite ends of said printed circuit boards through the openings therein;

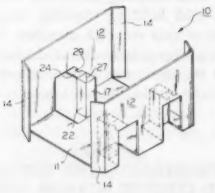
said tensioning means restoring said sections to their initial positions and causing the extremities of the third sides of said sections to exert respective forces on said circuit board which result in the lower surfaces at opposite ends of said board being held firmly in contiguity with the inner surfaces of said horizontal members.

4,068,793

CUSHIONING INSERT

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Apr. 25, 1977, Ser. No. 790,600
Int. Cl.[2] B65D *25/14*
U.S. Cl. 229—14 C **9 Claims**



1. A cushioning insert for shipping containers for a plurality of necked articles of commerce such as a television picture tube having a wide screen at one end and a narrow neck at the other end, said articles being arranged in allochiral relationship, said insert being formed from a cut and scored blank of paperboard or the like, and comprising:

a. a base panel having a pair of wall panels foldably joined to and upstanding from opposed edges thereof;

b. one of said wall panels and a portion of said base panel, adjacent a line of fold therebetween, having cut and scored portions erectable to define a support for the neck of one of said articles;

c. the other of said wall panels and said base panel having spaced portions of said base panel and spaced portions of said other wall panel adjacent a line of fold between said base panel and said other wall panel, having cut and scored portions erectable to define spaced supports, each for support of the neck of another one of said articles;

d. structure for locking each of said supports in position comprising locking flpas foldably connected to said panel portions and to each other and cut from said base panel and a correlative wall panel;

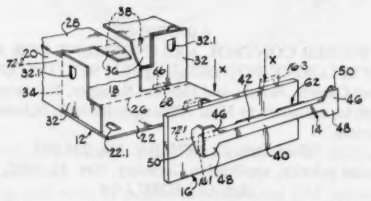
e. one of said locking flaps overlying the panel portion formed from a wall panel, and having a diagonal score line therein to provide folding of said locking flap over the panel portion formed from a wall panel.

4,068,794

CONTAINER PARTICULARLY, BUT NOT EXCLUSIVELY FOR USE IN SHIPPING PERISHABLES

Bryan Lawrence, Noordhoek, Cape Province, South Africa, assignor to The Deciduous Fruit Board, Cape Town, Cape Province, South Africa

Filed Sept. 24, 1976, Ser. No. 726,435
Claims priority, application South Africa, Sept. 25, 1975, 75/6116
Int. Cl.[2] B65D *5/02, 61/00*
U.S. Cl. 229—23 R **11 Claims**



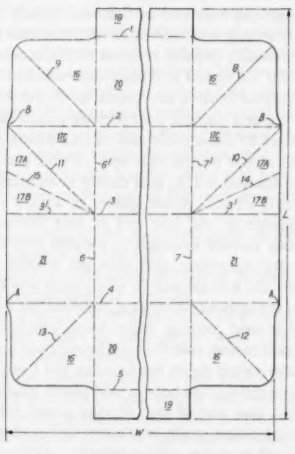
1. A container comprising a base panel, upstanding side panels and upstanding end panels, said panels forming an upwardly open tray, a locking panel at each end of each side panel, each pair of locking panels being parallel to and spaced from the adjacent end panel, a load bearing insert at each end of the container, each insert being between one of the end panels and the two adjacent locking panels, each insert, adjacent end panel and adjacent pair of locking panels forming a composite end wall of the container, and an end piece of inverted U-shape at each end of the container, the vertical walls of each end piece receiving the upper edge of one of the composite end walls therebetween, and elements which protrude upwardly at each end of the container with respect to the remainder of the container.

4,068,795

FOLDED CLOSED CARTON CONVERTIBLE TO OPEN TRAY

William Edward Forster, Liverpool, England, assignor to Metal Box Limited, Reading, England

Filed Aug. 30, 1976, Ser. No. 718,985
Int. Cl.[2] B65D *5/24*
U.S. Cl. 229—31 R **18 Claims**



1. A new article of manufacture comprising a blank for selectively forming an open tray and a closed carton of a size lesser than said tray, said blank being in the form of a generally

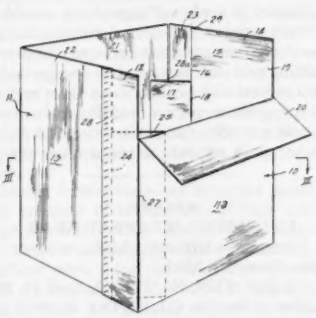
rectangular sheet, longitudinal fold lines dividing said sheet into a central and two end portions, and transverse fold lines dividing said central portion into body panels and said end portions into edge panels disposed at opposite ends of said body panels, said edge panels of each end portion including two remote connecting panels and only two end panels, one of said two end panels of each end portion having fold line means for positioning said one end panel selectively coplanar with the other of said two end panels and in overlapped relation to the other of said two end panels.

4,068,796

CONTAINER WITH INTEGRAL CORNER POSTS

Thomas D. Kullman, Jr., Wheeling, W. Va., assignor to Consolidated Packaging Corporation, Chicago, Ill.

Filed Jan. 27, 1976, Ser. No. 652,732
Int. Cl.² B65D 5/42
U.S. Cl. 229—49 **3 Claims**



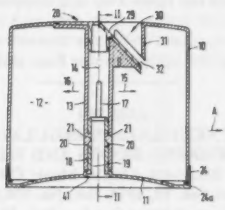
1. A reinforced container formed of foldable paper board comprising:
   a. first and second container segments,
   b. the first container segment being folded to form a first side wall and a major portion of a second side wall with an intermediate corner, one edge of said first side wall having a minor portion of a third side wall formed therewith with a first associated corner defined thereby, the opposite vertical edge of the major portion of said second side wall having a first inner lap extending therefrom,
   c. the second container segment being folded to form a fourth side wall and a major portion of said third side wall with an intermediate corner, one edge of said fourth side wall having a minor portion of said second side wall formed therewith with a second associated corner defined thereby, the opposite vertical edge of the major portion of said third side wall having a second inner lap extending therefrom,
   d. the minor and major portions of said second side wall being joined together at points causing said first inner lap to extend into the container adjacent to said first associated corner, and
   e. the minor and major portions of said third side wall being joined together at points causing said second inner lap to extend into the container adjacent said second associated corner.

4,068,797

SAVINGS BANK

Hans Rudolf, Leutenbach, and Gerhard Riegraf, Affalterbach, both of Germany, assignors to Gerhard Riegraf KG, Affalterbach, Germany

Filed Nov. 22, 1976, Ser. No. 743,666
Claims priority, application Germany, Nov. 28, 1975, 2553462
Int. Cl.² G07F 9/06
U.S. Cl. 232—4 R **6 Claims**



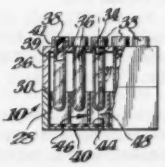
1. A molded savings bank consisting essentially of:
   first and second hollow body parts, said parts being molded so as to fit together and thereby form an essentially closed hollow money chamber,
   said first body part including an elongated hollow plug member integrally formed therewith,
   said second body part including an elongated hollow socket member integrally formed therewith,
   said plug member and said socket member having interfitting cross-sectional configurations and being of lengths such that said members telescopically engage each other over a substantial portion of their length,
   a distal end of said socket member including furcations formed such that said socket member is radially and resiliently expandable,
   said socket member further including inwardly projecting lugs integrally formed on said furcations,
   said plug member including recesses formed therein equal in number to the number of said lugs and axially disposed so as to be engaged by said lug when said body parts are united for releasably locking said body parts together, and
   a money slot formed in one of said body parts.

4,068,798

METHOD AND APPARATUS FOR STOPPER REMOVAL

Vernon Carl Rohde, Newtown, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 29, 1976, Ser. No. 728,001
Int. Cl.² B04B 5/02
U.S. Cl. 233—26 **6 Claims**



1. Apparatus for removing stoppers from test tubes using a centrifuge having a swinging bucket-type carrier comprising, in combination,
   a rack to be placed in said bucket-type carrier and having upper and lower separable members,
   said upper member having an upper surface defining plural apertures receiving said test tubes,
   at least a portion of each said stopper having an enlarged portion with an outside diameter greater than the diameter

of its associated test tube, thereby to permit said test tubes to hang from said upper surface supported only by their respective stoppers,

said lower member having a bottom,

supporting means associated with said lower member for supporting said test tubes against lateral movement, and

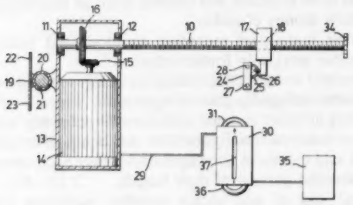
the spacing between the bottom of said test tubes and said lower member bottom being greater than the length of the stoppers along the axis of said tubes in contact with said tubes, whereby subjecting said rack to centrifugal force separates said test tubes from said stoppers to rest on said lower member bottom such that said stoppers can be discarded and access had to the contents of said test tubes by removing said upper member from said lower member.

4,068,799

AUTOMATIC VENTILATION REGULATING DEVICE FOR WINDOWS, DOORS AND THE LIKE

Eric Brodin, 44, Boulevard d'Italie, Monte Carlo, Monaco

Filed Feb. 10, 1976, Ser. No. 656,879
Claims priority, application Sweden, Feb. 10, 1975, 7501426
Int. Cl.² F01P *7/10*
U.S. Cl. 236—49 **5 Claims**



1. An automatic ventilation regulating device for windows, doors and like having an openable portion and a fixed portion, said device including: a threaded spindle rotatably mounted; a slide displaceable on said spindle when said spindle is rotated, said spindle being pivotally connected with one portion and said slide being pivotally connected with the other portion; and means to automatically vary the degree to which the window or door is opened in response to temperature, said means comprising intermittently operated motor means for rotating said spindle for short periods, and a settable thermostat for controlling the operation of said motor means to drive said motor means intermittently for short periods in response to the temperature in the ventilated room.

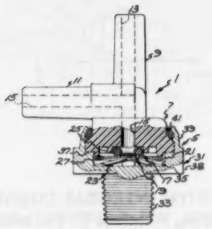
4,068,800

THERMALLY RESPONSIVE VALVE ASSEMBLY

John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 600,337, July 30, 1975, abandoned, which is a continuation of Ser. No. 428,569, Dec. 26, 1973, abandoned. This application Oct. 14, 1976, Ser. No. 732,280
Int. Cl.² G05D *23/10*
U.S. Cl. 236—101 C **6 Claims**

2. A thermally responsive valve assembly compising a body molding of a synthetic material and a thermally conductive metal valve body member, said metal valve body member being cup-snaped with an open-ended recess therein, having said synthetic valve body molding secured to said metal valve body member in said open recess end to form a chamber therebetween, and having an externally threaded portion on said metal valve body member for use in mounting the valve assembly, the synthetic valve body molding having a first nipple and and adjacent second nipple for connection to fluid lines, having an inlet passage in one of said nipples and an outlet passage in the other of said nipples, and having one end of each of said passages disposed in side-by-side relation to each other at one side of the chamber opening into said chamber, a valve seat within said chamber extending completely around said one end of one of said passages, an abutment on the synthetic body molding at said one side of the chamber defining at least part of a ring encompassing both of said one passages ends, a valve member comprising a generally circular dish-shaped thermostatic disk responsive to a variation in temperature to move with snap action between a first dished curvature and an inverted dished curvature, said dish-shaped bimetallic disk having a central portion and a perimeter and being disposed within said valve body chamber with said disk perimeter aligned with said abutment and with said central portion aligned with said



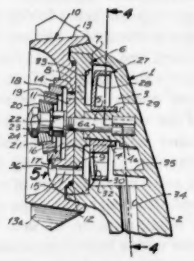
valve seat with one side of said disk facing both of said one passage ends, and spring means bearing against said metal valve body member and said bimetallic disk to bias said disk into engagement with said seat while said disk has said inverted curvature, thereby to apply sufficient force to said bimetallic disk to normally maintain said central disk portion against the valve seat to close communication between said valve passages while permitting said disk perimeter to engage said abutment to move said central disk portion away from said valve seat against said spirng bias to permit fluid flow between said valve passages at said one side of said disk when said disk moves to said first curvature in response to temperature change.

4,068,801

PULSATING JET SPRAY HEAD

Harold H. Leutheuser, Hillsdale, Mich., assignor to Alson's Corporation, Somerset, Mich.

Continuation-in-part of Ser. No. 678,042, April 19, 1976, which is a continuation of Ser. No. 621,376, Oct. 10, 1975, abandoned. This application Sept. 17, 1976, Ser. No. 724,117
Int. Cl.² B05B *1/08*
U.S. Cl. 239—102 **20 Claims**



1. A shower head comprising:

a. a housing forming a chamber defined in part by a plate having a set of fine spray supply ports, and a set of jet spray supply ports;

b. a peripherally engageable handle disk sealingly confronting and covering the plate, the handle disk having a set of fine spray nozzles and a set of jet nozzles, the handle disk being manually movable arcuately to connect the fine spray supply ports and fine spray nozzles, or to connect the jet spray supply ports with the jet spray nozzles;

c. means for producing a rotating current of water in the chamber;

d. and a rotor driven by the rotating water current, the rotor including a rotatable base plate disposed contiguous to the supply port plate, the base plate having closed and open portions movable past the supply ports in succession to produce at jet spray nozzles a pulsating effect.

4,068,802

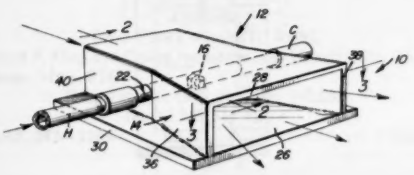
SPRAYING SYSTEM TO CONTROL AIR-BORNE COAL DUST

Shelby H. Goings, Rte. No. 7, Princeton, W. Va. 24740

Filed June 25, 1976, Ser. No. 699,809

Int. Cl.[2] F04F 5/02

U.S. Cl. 239—419.5 5 Claims



1. A spraying system for controlling airborne particulate matter, comprising, in combination:

a. a short open-ended housing including a subsonic diffuser portion having an entrance and an outlet, the diffuser portion diverging from the entrance to the outlet;

b. a liquid spray nozzle means including a pipe arranged transversely of the housing and mounting adjacent the entrance of the diffuser portion a diverging spray head disposed at the entrance of the diffuser portion for directing a diverging spray toward the outlet of the diffuser portion; and

c. the housing further including air intake means connected to the entrance of the diffuser portion and forming a passage of constant cross-sectional area and of the same size and cross-sectional configuration as the entrance to the diffuser portion and simultaneously forming an extension of the entrance of the diffuser portion, the passage extending from the entrance of the diffuser substantially the same distance as the outlet of the diffuser portion extends from the entrance of the diffuser portion for mixing air with the liquid spray and forming a mist which attracts and entrains particulate matter from air adjacent the mist downstream of the diffuser portion.

4,068,803

ROLLERMILLS

Richard Fullalove, Denton, and Frederick Spencer, Stockport, England, assignors to Henry Simon Limited, Stockport, England

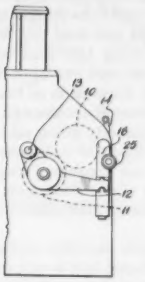
Filed Sept. 13, 1976, Ser. No. 722,574

Claims priority, application United Kingdom, Oct. 24, 1975, 43944/75

Int. Cl.[2] B02C 4/32

U.S. Cl. 241—32 7 Claims

1. In a rollermill comprising a pair of rotatable grinding rolls, means mounting one of said rolls for displacement relative to the other and comprising a movable actuating member for determining said displacement, resilient means providing a roll separation resisting force acting directly on said member for urging said one roll toward the other roll for normally maintaining the surfaces of said rolls in grinding engagement while permitting separation of said surfaces in the event an obstacle passes between them during grinding, and means including shear pin means effective after a predetermined separation of said surfaces permitted by said resilient means for substantially solidly resisting further movement of said member and thereby resisting further relative separation of said surfaces, said shear pin means being constructed and arranged to fail upon said predetermined separation of said roll surfaces when the roll separation force acting on said member exceeds the combined resisting forces of said resilient means and said shear pin means to permit increased separation of said surfaces to non-grinding



position while the full force of the resilient means alone remains acting on said member, whereby in the event of failure of said shear pin means and subsequent passage of the condition causing said increased separation of the roll surfaces said resilient means will continue with full force to urge said surfaces toward normal grinding relation.

4,068,804

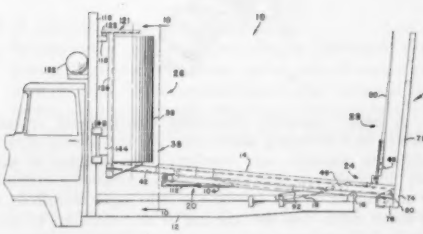
METHOD AND MACHINE FOR TEARING APART STACKED CROP MATERIAL BALES

L. Dennis Butler; Gene R. Butler, both of Kingsburg; Anthony E. Furtado, Riverdale; Jerry W. Welker, Fresno, and Donald M. Grey, Selma, all of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Division of Ser. No. 467,359, May 6, 1974. This application Dec. 22, 1975, Ser. No. 643,045

Int. Cl.[2] A01C 3/06

U.S. Cl. 241—101.7 10 Claims



1. In a machine for tearing apart crop material bales from a stack thereof, the combination comprising:

a mobile chassis;

a load bed pivotally mounted near its one end to said chassis and moveable between a generally horizontal position and a genrally upright retrieving position in which said load bed may be disposed generally against a side of said bale stack, said one end being the rear end with respect to the primary direction of travel of the machine;

stack retaining means including a pair of stack supporting arms mounted to said load bed and extending in a generally upright relation therefrom respectively adjacent opposing corners of said one end thereof, said arms being operable for movement between respective open positions disposed outwardly from opposite lateral sides of a lower end of said stack and respective closed positions disposed in supporting engagement with said stack lower end when said load bed is disposed in its upright stack retrieving

position, and a pair of stack clamping arms mounted to said load bed and extensible in a generally upright relation therefrom respectively adjacent opposing corners of said other opposite end thereof, said arms being operable for movement between respective open positions disposed outwardly from opposite lateral sides of an upper end of said stack and respective closed positions disposed in clamping engagement with said stack upper end when said load bed is disposed in its upright stack retrieving position;

means mounted on said load bed for advancing said stack longitudinally along said load bed toward an opposite other end of said load bed opposite to its one end when said load bed is disposed in its horizontal position;

a generally horizontally-positioned platform mounted on said chassis adjacently along said other end of said load bed when said load bed is disposed in its horizontal position, said platform capable of receiving and supporting a leading portion of said stack each time said stack advancing means advances said stack longitudinally along said load bed;

a crop material bale shredder operatively mounted on said chassis adjacent one lateral side of said platform; and

feeder means mounted to said chassis along said platform and moveable toward said shredder for feeding said leading stack portion along said platform in a transverse relation to the longitudinal extent of said load bed and into said shredder.

4,068,805

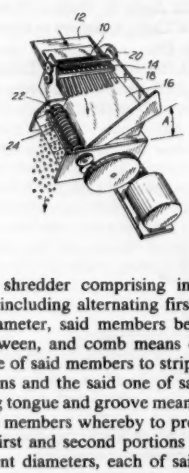
SHREDDING MACHINE

Fred Oswald, Forest Drive, Sands Point, N.Y. 11050

Filed Nov. 5, 1976, Ser. No. 739,268

Int. Cl.[2] B02C *19/00*

U.S. Cl. 241—159 **15 Claims**



1. A paper shredder comprising interdigitated rotatable members each including alternating first and second portions of different diameter, said members being adapted to shred paper therebetween, and comb means operatively extending into at least one of said members to strip paper therefrom, the said comb means and the said one of said members cooperatively including tongue and groove means to assist in removing paper from the members whereby to prevent jamming of said shredder, the first and second portions being cylindrical sections of different diameters, each of said sections being provided with annular grooves constituting part of said tongue and groove means.

4,068,806

BOBBIN TUBE CLAMPING DEVICE

Louis Moser, Hettlingen, and Albert Rüegg, Pfaffikon, both of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

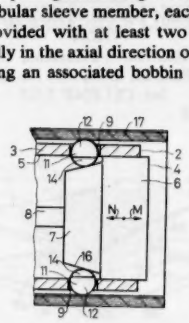
Filed Feb. 19, 1976, Ser. No. 659,325

Claims priority, application Switzerland, Mar. 14, 1975, 3241/75

Int. Cl.[2] B65H *75/30, 79/00*

U.S. Cl. 242—46.4 **5 Claims**

1. A bobbin tube clamping device for a bobbin chuck for textile bobbins, comprising a substantially hollow tubular sleeve member for supporting textile bobbin tubes, a chuck member mounted to be movable within the tubular sleeve member in the axial direction thereof, bobbin tube clamping elements cooperating with said chuck member, said chuck member being provided with a guide surface which is inclined with respect to the lengthwise axis of the chuck member for supporting and moving said bobbin tube clamping elements in a radial direction, said tubular sleeve member being provided with at least three openings extending substantially in the axial direction of the tubular sleeve member, each axially extending opening being provided with at least two guide surfaces extending substantially in the axial direction of the tubular sleeve member for guiding an associated bobbin tube clamping ele-



ment, each said bobbin tube clamping element having a portion guided by the two axially extending guide surfaces of the associated opening, said guided portion having a substantially arcuate end protruding from the tubular sleeve member, the axis of the radius of curvature of said arcuate end extending substantially transversely of the axis of said tubular member, said guided portion having opposed substantially parallel walls which contact the two axially extending guide surfaces of the associated opening, each bobbin tube clamping element having a gliding portion extending into the interior of the tubular sleeve member and having projection means extending beyond the distance between the parallel walls of the guided portion of such bobbin tube clamping element.

4,068,807

THREAD SUPPLY DEVICE

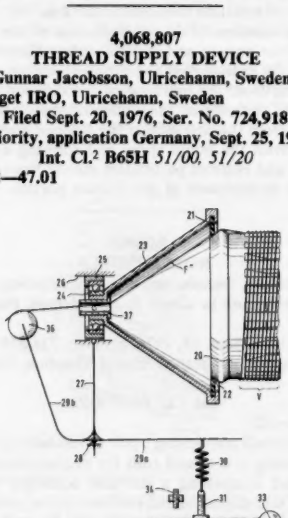
Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Sept. 20, 1976, Ser. No. 724,918

Claims priority, application Germany, Sept. 25, 1975, 2542824

Int. Cl.[2] B65H *51/00, 51/20*

U.S. Cl. 242—47.01 **11 Claims**



1. In a thread supply device having a storage drum on which the thread issuing from a storage bobbin can be tangentially wound and from which the thread can be endwise unwound,

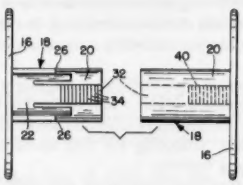
the storage drum having a conical brake surface over which the thread passes as it is unwound endwise from the drum, and resilient brake ring positioned in surrounding relationship to the brake surface and movable axially relative thereof for varying the contact brake pressure between the brake ring and the brake surface, the thread as withdrawn endwise of the drum passing between and being engaged by the brake ring and the brake surface, the improvement comprising adjusting means coacting between the brake ring and the withdrawn thread for automatically axially moving said brake ring relative to said brake surface in response to variation in the tension of the withdrawn thread downstream of the brake ring, said adjusting means causing the braking pressure between the brake surface and the brake ring to be increased in response to a decrease in the tension of the withdrawn thread, and vice versa.

4,068,808

TWO PART PLASTIC REEL

Richard J. King, c/o Galley Industries, 149 Hamilton St., Leominster, Mass. 01453

Filed Feb. 16, 1977, Ser. No. 769,283
Int. Cl.[2] B65H *75/14*
U.S. Cl. 242—118.4 **7 Claims**



1. A reel comprising two like parts, each part comprising a flange and a partial spool thereon,

each partial spool comprising a semi-cylindrical portion of a predetermined radius, and another semi-cylindrical portion of lesser radius, a springy longitudinal tongue forming a part of one of the semi-cylindrical portions,

interengaging means on the tongue on the outside aspect thereof, and complementary interengaging means on the other of said semi-cylindrical portions at the inside aspect thereof, said interengaging means forming a snap-over connection upon longitudinal motion inwardly together of said spool portions to a point where the free ends of each semi-cylindrical portion approaches the inside aspect of the flange on the other of said semicylindrical portions.

4,068,809

FILMSTRIP CARTRIDGE WITH FILM LOCK

Richard H. Koester, Rochester, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,880
Int. Cl.[2] G03B *1/04;* **G11B** *15/32;* **G03B** *23/02*
U.S. Cl. 242—197 **2 Claims**

1. A filmstrip cartridge with means to arrest the longitudinal movement of film having marginal perforations along an edge comprising:

a filmstrip cartridge having a guide channel thru which film may be moved along its longitudinal axis;

a resilient wire having one end secured to a portion of said cartridge;

said resilient wire being generally parallel to said longitudinal axis of said film;

a nub formed in said wire;

said nub having a first leg and a second leg;

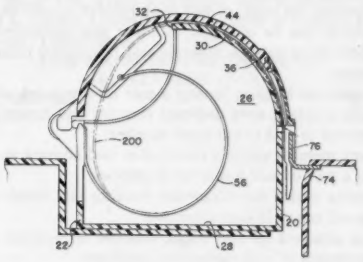
said second leg and said resilient wire defining an obtuse angle;

said nub capable of penetrating one of said perforations;

said nub movable to a first position in which said nub penetrates one of said perforations to arrest the longitudinal movement of said film;

said wire resiliently biasing said nub to said first position; and

said nub movable to a second position out of engagement with said perforations;



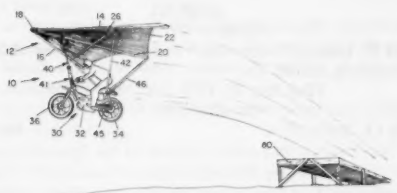
whereby a pulling force above a predetermined level applied along said longitudinal axis of said film will cause said nub to be forced out of said perforation.

4,068,810

COMBINATION MOTORCYCLE AND HANG-GLIDER

Douglas J. Malewicki, 14962 Merced Circle, Irvine, Calif. 92714

Filed May 5, 1975, Ser. No. 574,308
Int. Cl.[2] B64C *37/02*
U.S. Cl. 244—2 **3 Claims**



1. A motorized hang-glider comprising:

a flexible wing, said wing including a trifurcated frame having a central keel boom and a pair of converging, leading, edge booms intersecting at their forward ends, forming an acute triangle, said booms being held in rigid angular relation to each other by a transverse support beam;

a motorized vehicle having an engine therein, said vehicle being pivotally connected to said flexible wing, and positioned beneath and remotely therefrom, said motorized vehicle comprises:

a motorcycle;

truss means pivotally interconnecting said wing to said motorized vehicle, wherein said truss means comprises:

a forward adjustable strut member pivotally attached to the forward portion of said central keel boom at one end thereof, the opposite end of said strut being pivotally attached to said motorcycle, said forward, adjustable, strut member includes:

an upper, adjustable, elongated, strut member;

a lower, tubular, strut member whereby one end of said upper strut is slidably received therein;

a pair of centrally disposed strut members pivotally attached to the outer ends of said transverse support beam, each strut depending downwardly and inclined inwardly, pivotally attaching to either side of said motorcycle; and

a second pair of oppositely disposed strut members wherein the upper ends of said strut members are pivotally connected to the rear of said central keel boom and project

downwardly therefrom, being pivotally connected at their lower ends to said motorcycle;

pivotal means connecting one end of said truss means to said wing, and the opposite end thereof to said motorized vehicle;

a releaseable means mounted to one of said truss means whereby the angle of said wing relative to said motorized vehicle can be changed to cause said motorized hang-glider to be airborn; wherein said releaseable means comprises:

a cylindrical housing having a pair of elongated, diametrically opposed slots disposed therein, said housing being secured to said lower strut member;

a shank member slidably received in said housing and forming a part of said upper strut member;

a locking means for releaseably locking said shank in a retracted mode of operation; and

means attached to said shank member to provide limited movement of said upper strut member;

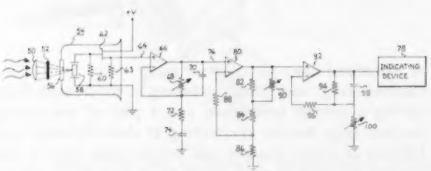
wherein said limiting means comprises a pin mounted to said shank and extending outwardly from opposite sides thereof, and slidably received in said respective slot in said housing.

4,068,811

HOTBOX DETECTOR

Paul W. Caulier, Greenwood, Va., assignor to General Electric Company, Salem, Va.

Filed Apr. 28, 1977, Ser. No. 791,955
Int. Cl.[2] B61K *9/06*
U.S. Cl. 246—169 A **10 Claims**



1. An improved circuit for use in apparatus for detecting the temperature of railroad car wheel journals as a train passes a fixed wayside point whereby infrared signals are transmitted from the wheel journals to the apparatus at a frequency corresponding to the rate at which said wheels pass said wayside point, said circuit comprising:

a. sensor means including a pyroelectric cell for outputting a voltage signal having a magnitude which is a function of the infrared input signals applied thereto, said sensor means exhibiting a substantially flat gain response to input signals occurring at frequencies within a first range and a gain response which varies exponentially with an increase in the frequency of the input signals within a second range of frequencies higher than said first range; and,

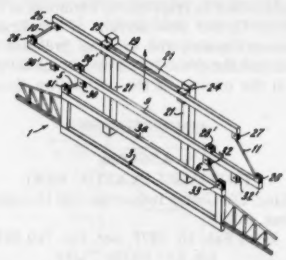
b. differentiating means responsive to the output of said sensor means to output a voltage signal having a magnitude porportional to the temperature of the wheel journal, said differentiating means having a substantially flat gain response to signals having a frequency within said first range and a gain response within said second range which varies exponentially at the same rate but in a direction opposite to that of said sensor means.

4,068,812

DEVICE FOR MOUNTING CANTILEVER-SUSPENDED BOOMS ON AGRICULTURAL VEHICLES FOR DISTRIBUTING TREATMENT MATERIALS

Pierre E. Demaret, 16, Chaus. de Namur, Moignelee, Belgium (B-5690)

Filed Oct. 16, 1975, Ser. No. 623,011
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—14 **5 Claims**



1. A mounting device for booms suspended from a vehicle and used for distributing agricultural-treatment materials or the like, said mounting device comprising, in combination:

an anti-roll mechanism including a rigid, horizontal deflecting bar;

primary connecting rods suspended angularly in a vertical plane from opposite ends of said deflecting bar;

an upper, rigid, horizontally-disposed longitudinal member parallel to said deflecting bar and including means for connection to a vehicle;

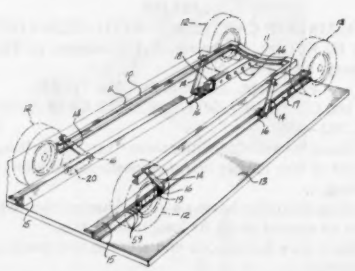
second connecting rods depending angularly in a vertical plane from opposite ends of said upper longitudinal member, said connecting rods being freely pivoted to their respective deflecting bar and longitudinal members, and a boom-frame pivotally-connected to the first-mentioned, primary connecting rods and having a boom projecting outwardly beyond said primary connecting rods.

4,068,813

VEHICLE TIE-DOWN METHOD AND APPARATUS

Maurice Stephen Chatwin, Seattle, and George Zell Porter, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sept. 28, 1976, Ser. No. 727,496
Int. Cl.[2] B60P *7/00*
U.S. Cl. 248—119 R **7 Claims**



1. Apparatus for tying-down a wheeled vehicle to a platform having edges, said vehicle having tires and resilient suspension members, said apparatus comprising:

at least one rail attached to said platform between said vehicle and said platform and adapted for attachment of a first stop means and installation of a second stop means;

first and second link assemblies for attaching said vehicle to said rail;

each of said link assemblies comprising:

vehicle attachment means for pivotally removably connecting said link assembly to said vehicle at spaced apart points aligned with said rail;

platform attachment means for removably engaging said rail and being free to move along said rail while engaging it;

tension means connecting said vehicle attachment means to said platform attachment means, having a length such that said first and second link assemblies are in essentially vertical positions when pivotally connected to said vehicle and movably engaged with said rail;

placement means for moving said rail engaging platform attachment means of said second link assembly to a position closer to said rail engaging platform attachment means of said first link assembly while both are engaged with said rail, so that said first and second link assemblies are pivoted out of said essentially vertical positions into angled positions so that the vertical distance between said pivotally connecting vehicle attachment means and said movable, rail engaging platform attachment means is decreased, causing said tires and suspension members to be effectively compressed;

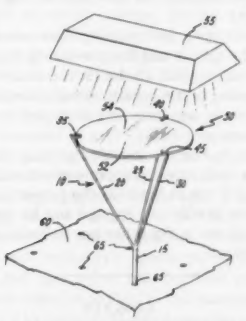
locking means for removably securing said rail engaging platform attachment means of said second link assembly to said rail in a predetermined longitudinal disposition with respect to said first link assembly along said rail.

4,068,814

SEMICONDUCTOR BODY HOLDER

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,237
Int. Cl.[2] B01J *17/12, 17/02*
U.S. Cl. 248—176 **1 Claim**



1. A semiconductor body holder comprising:

a base comprising a rigid refractory member comprising a quartz rod and having first and second ends, said first end being adapted to support said holder and

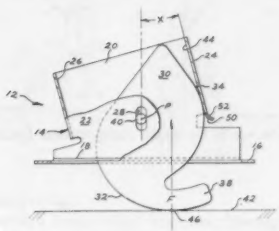
three flexible refractory arms, of quartz each of said arms including distal and proximal ends, the proximal end of each arm being fixed to said second end of said base, said arms forming an obtuse angle of quartz with said base and each of said arms including a refractory finger fixed to the distal end thereof, each of said fingers extending generally toward the central axis of said base, the orientation of said fingers, said arms and said base with each other minimizing any shadowing effect of the arms upon radiation emitted by a wafer supported by the holder as well as minimizing the inducement of undesirable thermal gradients in said wafer, each of said fingers being capable of engaging only a minimal outermost peripheral surface area of a wafer and each arm being capable of only contacting a minimal portion of an edge of a wafer.

4,068,815

SELF LOCKING SUPPORT MECHANISM

Gerhard K. Losert, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 26, 1977, Ser. No. 762,565
Int. Cl.[2] F16M *11/24*
U.S. Cl. 248—188.2 **4 Claims**



1. A self-locking support mechanism for leveling an appliance relative to the floor, comprising:

a. a support member secured to the appliance and having at least one end wall and one side wall, said side wall having a slot;

b. a rotatable cam member having:

i. a pivot point,

ii. a cam surface to contact the floor for height adjustment, said cam surface contacting the floor at a point through which a vertical force moment is applied to the cam member,

iii. a radius surface relative to the pivot point and opposite the cam surface;

c. a pin through the pivot point of the cam member and the slot in the support member side wall and slidably movable within the slot, said slot and support end wall being spaced from and converging toward each other in a direction away from the floor and arranged such that the vertical force moment is applied to the cam member between the pivot point and the support end wall; and

d. means for rotating the cam member, whereby upon rotating the cam member the pin is moved within the slot away from the floor and the cam member radius surface abuts the support end wall to lock the cam member.

4,068,816

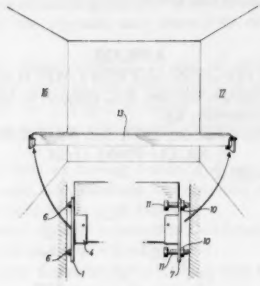
SUPPORT ASSEMBLY

Karl Gunnar Andersson, Handen, Sweden, assignor to Friktions-Stamp AB, Sweden

Filed Dec. 2, 1976, Ser. No. 747,075
Int. Cl.[2] A47H *1/14*
U.S. Cl. 248—251 **9 Claims**

1. A support assembly for mounting a crossbar between two opposite walls, including a pair of end parts each including a plate, one surface of each of said plates being provided with a U-shaped yoke, the bottom web of said yoke forming a vertical support for the associated end of the crossbar and the legs of said yoke forming lateral supports for the associated end of said crossbar, one plate being provided with fixed pegs to rest against one of the walls, the other plate being provided with throughgoing threaded clamping bolts adapted to be screwed against the other wall, said pegs and said clamping bolts being

generally aligned parallel to the longitudinal axis of said crossbar and being operable to clamp the entire support assembly to



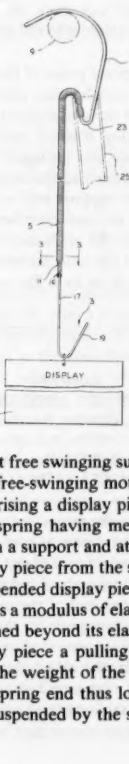
the opposite walls by axial compression forces through the crossbar.

4,068,817

SUSPENSION HANGER

Sol J. Berger, 310 Melvin Drive, Northbrook, Ill. 60062

Filed Dec. 29, 1976, Ser. No. 755,467
Int. Cl.[2] B42F *13/00*
U.S. Cl. 248—340 **10 Claims**



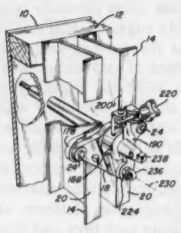
1. A variable height free swinging suspension display unit of the type to be set in free-swinging motion by ambient air currents, said unit comprising a display piece and a slender cord-like helically coiled spring having means at one end for suspending the unit from a support and at its other end means for suspending the display piece from the spring for free swinging movement of the suspended display piece, characterized by the fact that the spring has a modulus of elasctcity small enough to permit it to be stretched beyond its elastic limit by exerting on the suspended display piece a pulling force which is a small amount in excess of the weight of the display piece to permanently lengthen the spring end thus lower the level at which the display piece is suspended by the spring.

4,068,818

CLAMPING LOCK FOR TIE ROD ENDS

H. Gordon Gates, Denver, Colo., assignor to Gates & Sons, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 494,967, Aug. 5, 1974, Pat. No. 3,984,079. This application Aug. 13, 1976, Ser. No. 714,032
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.[2] E04G *17/06*
U.S. Cl. 249—42 **10 Claims**



1. A clamping lock for use with a tie rod end in a settable casting combination from structure, said clamping lock comprisng:

a base plate having a tie rod end receiving bore extending therethrough and a jaw confronting surface;

means on said base plate for fastening said base plate to said casting form structure;

a pair of jaws pivotally anchored on said base plate and selectively movable about a first pivot axis between an open position and a closed position about the tie rod end, said jaw confronting surface of the base plate uniformly decreasing in thickness bilaterally from a line corresponding to the parting line of the jaws when closed to exert a wedging effect on the jaws in closing and a quick release effect in opening, each of said jaws having a pair of spaced projections;

means on said jaws for coacting between the jaws when closed and a tie rod end for preventing axial movement of the jaws with respect to the tie rod end;

a threaded swing bolt pivotally mounted between the pair of projections on one jaw and arranged to pivot about a second pivot axis; and

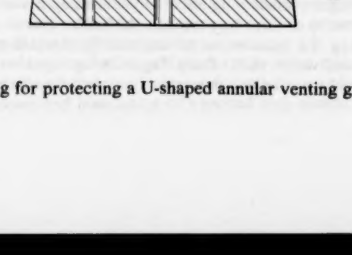
a handle threaded on the threaded portion of the swing bolt, said swing bolt being pivotable about said second pivot axis so that it can fit between the projections on the other jaw and the handle can engage and be tightened against said projections on the other jaw to lock said jaws in their closed position.

4,068,819

PORT PROTECTIVE RING IN A MALE MOLD

Douglas M. Bell, San Rafael, Calif., assignor to Handi-Kup Company, Corte Madera, Calif.

Filed Oct. 4, 1976, Ser. No. 729,221
Int. Cl.[2] B29D *27/00*
U.S. Cl. 249—66 A **9 Claims**



1. A ring for protecting a U-shaped annular venting groove

circumscribing a frustoconical male mold used for forming objects of expansible resin beads comprising:

a rigid, nonexpansible, nondeformable annular element of a diameter adapted to snap over said male mold and to fit into said groove

wherein said element when in position in said groove defines an annular fluid distributing chamber and at least one permanently open fluid outlet aperture

and wherein said aperture is for establishing a restriction having a minimum dimension less than the mean cross-sectional dimension of the unexpanded resin beads, for providing a continuous fluid flow path and for minimizing flow induced noise during fluid escape.

4,068,820

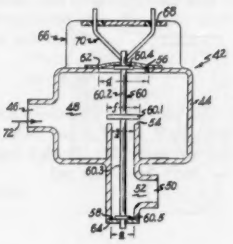
VALVE

Daniel R. Pimentel, Seekonk, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 500,215, Aug. 26, 1974, Pat. No. 3,974,844. This application Jan. 15, 1976, Ser. No. 649,304

Int. Cl.² F16K *31/00*

U.S. Cl. 251—11 **7 Claims**



1. A valve device comprising valve body means having an inlet passage and an outlet passage, having a valve seat between said passages, and having a pair of apertures communicating with said respective passages in alignment with said valve seat, a valve member having a disc portion and having a pair of stem portions extending from respective opposite sides of said disc portion into said respective apertures, said valve member being mounted in said valve body means for movement between an open valve position having said disc portion spaced from said valve seat and a closed valve position having said disc portion engaging said valve seat, a pair of flexible diaphragm means secured to respective valve member stem portions and secured to sealing relation to said valve body means around said respective apertures, said flexible diaphragm means and said valve member disc portion having relative areas to be exposed to fluid in said passages for moving said valve member to said closed valve position with a selected force and for normally holding said valve member in said closed valve position with at least an increment of said force when fluid is introduced into said passages through said inlet passage, an actuator wire of a selected metal alloy secured outside said valve body means between an exterior portion of said body means and a portion of said valve member extending outside the body means through one of said apertures to be deformed from an original length to a second relatively longer length as said valve member is moved to said closed valve position in response to said force while said metal alloy displays a relatively low modulus of elasticity below a transition temperature and to abruptly return to said original length and to display a relatively higher modulus of elasticity to move said valve member to said open valve position against said force when said metal alloy is heated above said transition temperature, and means selectively directing electrical current through said actuator wire for selectively self-heating said metal alloy above said transition temperature.

4,068,821

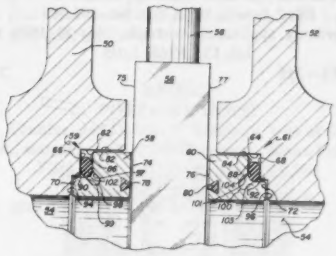
VALVE SEAT RING HAVING A CORNER GROOVE TO RECEIVE AN ELASTIC SEAL RING

Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,893

Int. Cl.² F16K *3/20*

U.S. Cl. 251—172 **6 Claims**



1. A valve comprising:

a. a housing with a longitudinal bore therethrough,

b. a valve chamber intersecting said bore,

c. a valve member mounted within said valve chamber for movement between open and closed portions,

d. a pair of facing annular recesses surrounding said bore at said valve chamber, each of said recesses having an end wall joining said bore and an annular wall coaxial with said bore joining said end wall and said valve chamber,

e. a pair of seat ring members loosely mounted within said annular recesses for floating back and forth movement in said recesses, each of said seat ring members having an outer circumference comprising a pair of generally parallel inner and outer stepped peripheral surfaces, a radially disposed outwardly facing annular surface connecting the stepped peripheral surfaces, and a radially disposed seat end surface joining said inner stepped peripheral surface and the internal bore of said seat ring member, said seat ring member having a peripheral groove at the juncture of said inner stepped peripheral surface and said radially disposed outwardly facing annular surface, said groove having a pair of generally parallel opposed sides respectively joining said inner stepped peripheral surface and said radially disposed outwardly facing annular surface at obtuse angles,

f. a seal ring chamber between each of said seat ring members and the end wall of the associated annular recess, said seal ring chamber defined by said recess annular wall, said inner stepped peripheral surface, said radially disposed outwardly facing annular surface, and said recess end wall, and

g. a resilient O-ring positioned within the seal ring chamber and having a cross-sectional span sufficient to seal between said recess end wall and said radially disposed outwardly facing annular surface when said O-ring is initially positioned in said seal ring chamber upon assembly of said valve, said groove sides being spaced apart a distance substantially approximately the original cross-seotional radius of said O-ring, the depth of said groove being at least equal to the original cross-sectional diameter of said O-ring to receive a portion of said O-ring between said generally parallel sides when said O-ring is subjected to mechanical compression between said recess end wall and said radially disposed outward facing annular surface so said O-ring is squeezed no more than approximately 35 percent between said end wall and said radially disposed outwardly facing annular surface in order that the elastic limit of said O-ring is not exceeded, said radially disposed seat end surface contacting said recess end wall to limit outward movement of said seat ring member when the

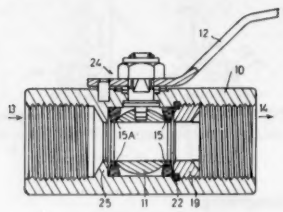
groove has received a portion of said O-ring with said O-ring being in fluid-tight sealing contact with said recess end wall, said radially disposed outwardly facing annular surface, and said groove sides.

4,068,822

BALL VALVE

Cecil Graham Richards, Aspley, Australia, assignor to B. C. Richards & Co. Pty. Ltd., Geelung, Australia

Filed June 1, 1976, Ser. No. 691,483
Claims priority, application Australia, May 29, 1975, 1804/75
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—315 **2 Claims**



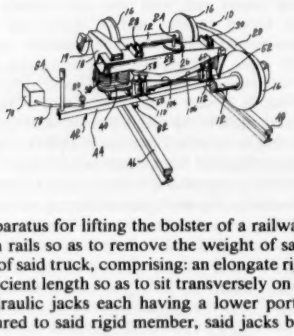
1. A seal assembly in a ball valve, said assembly including: a seal ring contacting the surface of the ball; a body insert longitudinally movable along a fluid passageway in the body of the valve and contacting the rear face of said seal ring to force said seal ring against the ball, said passageway being formed with an annular groove having flat front and rear faces, and said insert including a front contacting surface and being formed with an annular rebate in the contacting surface thereof, said rebate including a flat rear face; and a peripheral ring of deformable material lying partly in said rebate and partly in said annular groove formed in said passageway, said ring having flat front and rear faces, when in an undeformed condition, the front flat face of said peripheral ring when said insert is in an assembled position contacting the front face of said groove and the rear face of said seal ring, and the rear flat face of said peripheral ring contacting the flat rear face of said rebate, thereby to provide solid line contact at both the front and rear flat faces of said ring to provide a peripheral seal between said seal ring and the body of the valve.

4,068,823

APPARATUS FOR LIFTING THE BOLSTER OF A RAILWAY CAR TRUCK

Gerard Belanger, Boucherville, Canada, assignor to Tecnobec, Inc., Canada

Filed Jan. 10, 1977, Ser. No. 758,336
Claims priority, application Canada, Jan. 30, 1976, 245046
Int. Cl. B66f *7/26*
U.S. Cl. 254—89 H **9 Claims**



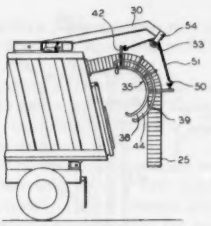
1. An apparatus for lifting the bolster of a railway car truck mounted on rails so as to remove the weight of said car from other parts of said truck, comprising: an elongate rigid member having sufficient length so as to sit transversely on both rails; a pair of hydraulic jacks each having a lower portion thereof fixedly secured to said rigid member, said jacks being spaced from one another on said rigid member a distance corresponding generally to the distance separating said rails; fitting means mounted at the upper portion of each said jack for engaging said bolster; conduit means mounted to said rigid member for hydraulically connecting said jacks to an external power source; means on said rigid member allowing said rigid member to be rotated about an axis parallel to its longitudinal axis whereby, after a portion of said rigid member containing both said jacks is inserted sidewise beneath said bolster to lay on both rails with said jacks extending in a plane substantially parallel with a plane that includes said rails, said rigid member may be rotated to bring said jacks in vertical alignment with said bolster for jacking engagement therewith.

4,068,824

POWER BOOM AND VACUUM HOSE SUPPORT

Thomas P. Flynn, Milwaukee, Wis., assignor to Super Products Corporation, Milwaukee, Wis.

Filed June 21, 1976, Ser. No. 697,825
Int. Cl.[2] B66F *11/00*
U.S. Cl. 254—124 **4 Claims**



1. A system for supporting and manipulating an elongate flexible hose, said system comprising:

a vertically elevatable boom means having a first end mounted to a boom support and a second end elevatable with respect to said first end,

a pulley means mounted adjacent said second end of said boom means,

a hose support cradle including a plurality of generally C-shaped elongate rods which together define a generally C-shaped elongate hose support channel, said channel being generally semicircular in cross-section and having a hose accommodating length which exceeds the length of at least one of said rods, said cradle also including means connecting said rods for imparting structural rigidity to said cradle and two spaced apart fastener receiving means on said cradle, and

a cable passing over said pulley means and having first and second ends fastened to said fastener receiving means of said cable.

4,068,825

DOUBLE PARALLELOGRAM JACK

Roger Macpherson, 183 Pleasant Way, Penfield, N.Y. 14526

Filed Oct. 26, 1976, Ser. No. 735,164
Int. Cl.[2] B66F *3/00*
U.S. Cl. 254—124 **10 Claims**

1. A jack, comprising

a base,

an intermediate frame,

a first plurality of links pivotally connected to said base and said frame to support said frame on said base for translational movement in an arc about a pair of spaced axes and between first and second limit positions,

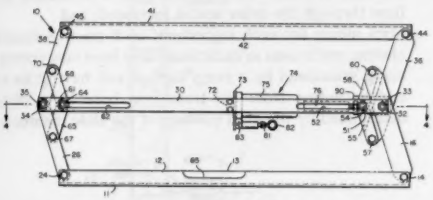
a load-bearing member,

a second plurality of links pivotally connected to said frame

and said load-bearing member to support said load-bearing member on said frame for movement relative thereto,

drive means mounted on said frame for arcuate movement therewith and having a reciprocable driver,

a third plurality of links pivotally connected to said frame and to at least certain of said first and second pluralities of



links for translational movement with said frame relative to said base and said load-bearing member, and

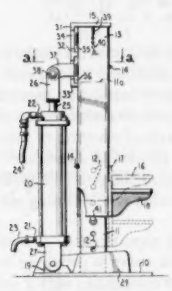
means pivotally connecting said third plurality of links to said driver and operative to impart said arcuate movement to said frame, and to reciprocate said load-bearing plate linearly toward and away from said base plate upon reciprocation of said driver.

4,068,826

HEAVY DUTY LIFTING DEVICES

Leroy A. Scott, R.R. No. 6, Paola, Kans. 66071

Filed July 21, 1977, Ser. No. 817,578
Int. Cl.[2] B66F *7/28*
U.S. Cl. 254—134 **7 Claims**



1. A jack construction comprising, in combination,

a substantially rectangular base plate,

an elongate post of rectangular cross-section fixed at one end thereof to the base plate and extending substantially normal thereto,

an elongate sleeve of rectangular cross-section congruent to the cross-sectional shape of the post having one open end and one closed end mounted on and movable along and with respect to said post,

the length of the sleeve substantially that of the post,

the closed end of the sleeve positioned away from the base plate, there being a flat end plate closing the end of said sleeve which is adapted to receive work loads thereon,

first lug means on the base plate adjacent to one side of the post which is adapted to receive and engage one end of a hydraulic cylinder,

the said end plate of the sleeve having an extending, substantially rectangular lip projecting outwardly past the wall of the sleeve next the side of the post adjacent to said lug means,

means on the upper portion of the sleeve and on the side thereof next to the said first lug means forming a pair of horizontal slideways of a size and configuration equal to one another, said slideways positioned one above the other and below said lip,

two slides removably insertable in the said slideways, one slide into each slideway, one of said slides having second lug means thereon for engagement with the piston rod of the hydraulic cylinder,

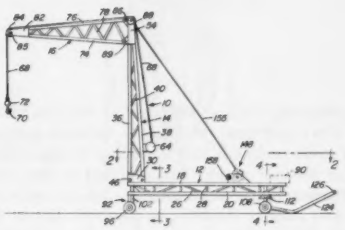
and means cooperating between the post and the sleeve for fixing an extended position of the sleeve with respect to the post once the sleeve is extended thereon by action of the hydraulic cylinder.

4,068,827

PORTABLE HOIST

Larry J. Fanning, and Dwight L. Duimstra, both of Sioux Falls, S. Dak., assignors to Dwight L. Duimstra, Sioux Falls, S. Dak.

Filed June 29, 1976, Ser. No. 700,856
Int. Cl.[2] B66C *23/60*
U.S. Cl. 254—139.1 **6 Claims**



1. A portable hoist comprising a generally elongated, rectangular, horizontally disposed frame having a substantially planar bottom surface, an elongated upright mounted on one end of said frame and extending upwardly therefrom, an elongated boom mounted at the upper end of the upright and extending generally horizontally, said boom and said frame extending in opposite directions from the upright, winch means mounted on said hoist and including a lift cable entrained over a pulley at the outer end of the boom, means on the free end of the lift cable for engaging a load, said upright being detachably connected to said frame by removable pin means, and removable pin means connecting the boom to the upper end of the upright, said winch means including a winch drum and motor mounted on the upright adjacent the lower end thereof, a pulley mounted on the upper end of the upright in alignment with the winch drum for receiving the lifting cable with the lifting cable being wound on said winch drum, a wheeled unit mounted in underlying relation to each end of the frame to enable the frame to be moved from one location to another, one of said wheeled units being steerable for guiding movement of the hoist, the wheeled unit adjacent the end of the frame to which the upright is connected including a rigid axle journaling more than two wheels along a single axis and lying in parallel planes, upstanding support pins rigid with the axle and terminating in upper ends extending above a horizontal member rigidly spaced above said axle, said frame including a pair of vertical sleeves rigidly mounted in the corners of said frame at one end thereof and telescopically and detachably receiving the pins for mounting the wheeled unit below the frame.

4,068,828

BLENDING OF PARTICULATE MATERIALS

Robert R. Goins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

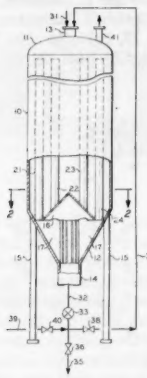
Filed Nov. 19, 1976, Ser. No. 743,197
Int. Cl.[2] B01F *15/00, 5/00*
U.S. Cl. 366—136 **12 Claims**

1. Solids blending apparatus comprising:

a vessel having a solids inlet in the upper region thereof and a solids outlet in the lower region thereof;

a first baffle disposed within said vessel between said upper region and said lower region, said first baffle blocking a substantial amount of communication between said first and second regions; and

a plurality of conduits positioned within said vessel so as to extend in generally vertical directions downwardly from said upper region past said baffle to said lower region, each of said conduits having at least one first opening therein in said upper region to permit solids disposed in said upper region to enter the conduit and flow by gravity downwardly toward said lower region, each of said conduits having a second opening in said lower region to



discharge solids into said lower region, all of said first openings except the uppermost in each of said conduits being provided with baffle means to permit solids to enter the conduit when solids are flowing downwardly through the conduit from a region above the opening, and the vertical locations and numbers of said first opening and the sizes of said baffle means being such that when the upper region of said vessel is filled with solids to the uppermost first opening and permitted to empty by gravity flow of solids through said conduits the total flow of solids through said conduits at progressively lower elevations increases substantially as a linear function with respect to vertical distance measured downwardly from said uppermost first opening.

4,068,829

HEAD FOR MIXING AND DISCHARGING AT LEAST TWO INGREDIENTS

Daniel Laurent, Meylan, and Alain Felten, Grenoble both of France, assignors to Secmer S.A., France

Filed Jan. 27, 1976, Ser. No. 652,698

Claims priority, application France, Jan. 28, 1975, 75 03193

Int. Cl.[2] B01F *15/00;* **F17D** *3/00*

U.S. Cl. 366—177 **13 Claims**

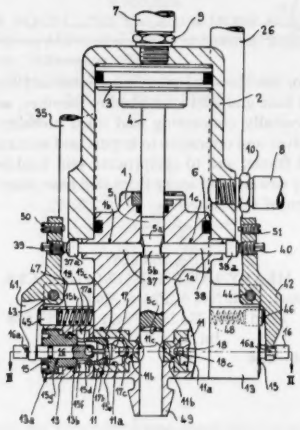
1. A head for mixing at least two ingredients supplied thereto from plural sources under pressure and for discharging the mixed product, comprising:

a body having a main bore therethrough, having a mixing chamber, and having a separate transverse bore extending into said main bore corresponding with each ingredient;

a slide member in the main bore and having ramp surfaces in the vicinity of said transverse bores, and means for moving the slide member axially in the main bore;

distribution valve means corresponding with each ingredient coupled to a source and extending through the body, and each valve means having two valves controlling the flow of the ingredient in different branches of the valve including a discharge branch communicating with a discharge seat at a discharge orifice extending into said mixing chamber, and including a recirculation branch having a return flow seat and leading to a duct returning to the associated source, and each valve means having a stem reciprocable through said discharge and return flow seats and having needle valves facing the respective seats and operative to control the flow through the seats inversely, whereby the flow through one seat is restricted as the flow through the other seat is increased; and

control means for each ingredient, each control means including rod means in each transverse bore contacting and being positioned by a ramp surface and having an outer end extending from the transverse bore by a distance determined by the axial position of the slide member, and



including a lever for each rod means pivotally attached to the body of the head and having one leg tilted about the pivot in response to motion by the rod means and having another leg coupled to reciprocate a corresponding valve to displace the axis of pivoting of the actuating levers for one valve with respect to the other, which can be done simply by changing the point of application of push rods which are associated with a sliding member against which the rods rest.

According to one modification, the pivoted lever which serves to actuate each valve is provided with an axially regulated abutment which cooperates with a pendulous arm moved by contact with the corresponding control rod. means.

4,068,830

MIXING METHOD AND SYSTEM

Joseph B. Gray, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

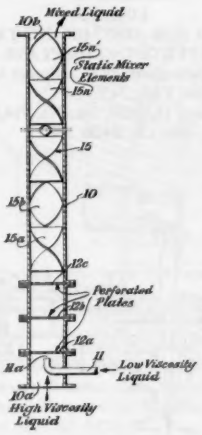
Filed Jan. 4, 1974, Ser. No. 430,756

Int. Cl.[2] B01F *15/02, 5/10*

U.S. Cl. 366—174 **2 Claims**

1. A method of mixing a low viscosity liquid with a high viscosity liquid where the proportion of said low viscosity liquid to said high viscosity liquid is in the volumetric flow ratio range of about 0.01 to 0.2, and where the ratio of viscosities of said high viscosity liquid to said low viscosity liquid is in the range of about 4×10^3 to about 10^6 comprising introducing said low viscosity liquid under pressure into a flowing stream of said high viscosity liquid, thence flowing said liquids

through a perforated plate establishing a multiplicity of wakes of said low viscosity liquid on the downstream side of said



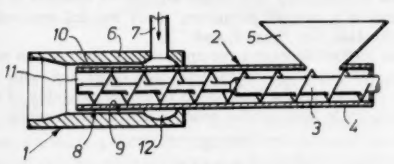
plate, and then impelling said low viscosity and said high viscosity liquids through a static mixing element.

4,068,831

APPARATUS FOR THE PRODUCTION OF FOAM MATERIALS CONTAINING A FILLER MATERIAL

Wilfried Ebeling, Cologne, and Klaus Schulte, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 26, 1976, Ser. No. 717,813
Claims priority, application Germany, Sept. 13, 1975, 2540934
Int. Cl.[2] B01F *7/08, 15/02*
U.S. Cl. 366—156 **6 Claims**



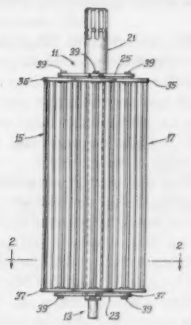
1. An apparatus for the production of foam materials containing a filler material, such as waste foam material, from at least two flowable chemical components in addition to the filler material, comprising a storage container for each component, a pipe leading from each container to a mixing head via a dosing pump, and a charging mechanism for powdery to fine-grained filler material arranged in at least one of the pipes between the mixing head and the dosing pump, said charging mechanism comprising a component feed pipe, and a feed screw for the filler material having a tubular housing having a discharge opening, said tubular housing positioned inside said feed pipe and spaced inwardly therefrom, the discharge opening of said housing projecting axially into said feed pipe, so as to form an annular slot between the feed pipe and the housing to which slot a pipe from the dosing pump is connected, one end of the feed pipe being sealed to the housing.

4,068,832

DASHER

Philip H. Blaetz, Barrington, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Dec. 8, 1975, Ser. No. 638,291
Int. Cl.[2] A01J *11/00;* **A23C** *1/00;* **B01F** *7/00*
U.S. Cl. 366—280 **6 Claims**



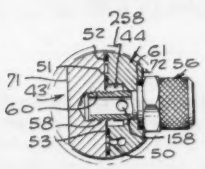
1. A dasher adapted for mounting within a generally cylindrical whipping chamber, said dasher comprising a drive shaft defining a first axis of rotation, a pair of support plates affixed to said drive shaft in axially spaced relation thereon, said support plates lying in substantially parallel planes generally perpendicular to said first axis of rotation, at least two cages mounted between said support plates, each of said cages including a pair of substantially parallel axially aligned end plates having a plurality of elongate elements secured therebetween in substantially normal relation thereto, said elongate elements of each cage having their longitudinal axes intersecting a circle lying in a plane disposed normal to said axes and said elongate elements being disposed in equidistantly circumferentially spaced relation about said circle, each of said cages being freely rotatable relative to said support plates for rotation about an axis parallel and eccentric to said first axis and without interference with said chamber.

4,068,833

TORCH

Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

Continuation of Ser. No. 459,133, April 8, 1974, abandoned. This application May 17, 1976, Ser. No. 687,033
Int. Cl.[2] B23K *7/00, 7/10*
U.S. Cl. 266—48 **5 Claims**



5. A torch comprising:

an outer tube centered about a predetermined longitudinal axis;

a valve body at a first end of said tube adapted to be connected to sources of fuel and oxygen;

conduit structure connnected to said valve body and projecting therefrom within said tube toward the second end thereof;

valve means carried by said body for controlling the delivery of fuel and oxygen to said conduit structure;

a first hinge part at said second end of said tube connected to

said conduit structure and containing passages for receiving fuel and oxygen from the conduit structure;

a second hinge part detachably connectable to said first hinge part for relative rotary adjusting movement about a hinge axis disposed essentially transversely of said axis of the tube and containing passages communicating in different angular settings of the second hinge part with said passages in the first hinge part to receive fuel and oxygen therefrom;

a nozzle carried by said second hinge part through which said fuel and oxygen are emitted to produce a flame and adjustable to different angular settings relative to said first hinge part with said second hinge part;

said tube having an internal size large enough to pass said first hinge part axially through said tube, in a relation enabling said tube to be moved to a position about said conduit structure by bodily advancement of said tube axially past said first hinge part while received thereabout;

said first hinge part having at one side thereof a generally flat fluid conducting face at which said passages of the first hinge part terminate and which extends essentially transversely of said hinge axis, said face being disposed approximately in a plane which contains said axis of the tube and which extends essentially diametrically with respect to said tube, said face having a width transversely of said axis of the tube which is just slightly less than the internal diameter of said tube;

said second hinge part having a fluid conducting face opposite and closely proximate to said face of the first hinge part and at which said passages of the second hinge part terminate;

seal means between said fluid conducting faces disposed essentially in said plane which extends diametrically with respect to said tube and positioned to pass fuel and oxygen streams from said first hinge part to said second hinge part in sealed isolation from one another; and

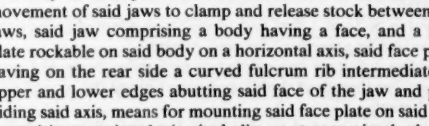
a threaded fastener having a shoulder which is clamped against said second hinge part in retaining relation, and having a reduced diameter tubular shank with external threads connected to said first hinge part and containing an internal passage opening at one end into one of said passages in said first hinge part, said tubular shank having at an opposite end thereof a side wall opening near said shoulder for placing said internal passage in communication with one of said passages in the second hinge part.

4,068,834

CLAMP WITH ROCKABLE JAW FACE PLATE

John L. Mortoly, Poughkeepsie, N.Y., assignor to James L. Taylor Manufacturing Company, Poughkeepsie, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,041
Int. Cl.[2] B25B *1/22*
U.S. Cl. 269—264 **7 Claims**



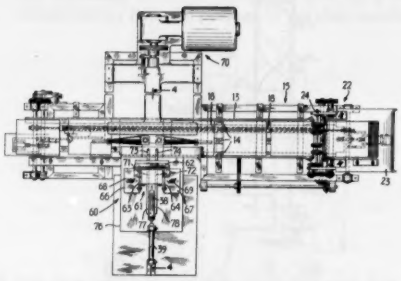
1. A clamp jaw for use in a clamp wherein there are two relatively movable jaws on a frame and means to cause relative movement of said jaws to clamp and release stock between the jaws, said jaw comprising a body having a face, and a face plate rockable on said body on a horizontal axis, said face plate having on the rear side a curved fulcrum rib intermediate its upper and lower edges abutting said face of the jaw and providing said axis, means for mounting said face plate on said jaw comprising a spring device including parts engaging both said body of the jaw and the front of said face plate and the rear side of said face plate on at least one side of said rib means holding said face plate on the jaw body, and means providing resilient rocking action of said face plate on said axis.

4,068,835

APPARATUS FOR ASSEMBLING TAKE-ONE ADVERTISING DISPLAYS

Allen A. Bortner, Searingtown, N.Y., assignor to Charles Offset Company, Inc., New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,993
Int. Cl.[2] B42B *2/00*
U.S. Cl. 270—53 **8 Claims**



1. Apparatus for assembling "take-one" coupons to a support panel comprising:

means for moving said panel along a defined path and for stopping said panel at a predetermined point on said path;

means for separating a preset number of "take-one" coupons from a stack of said coupons in order to form a pack of coupons, said means for separating including a wedge-shape blade, means for moving the blade along a second defined path into the stack of coupons at a height sufficient to separate the preset number of coupons from the bottom of the stack, and a displaceable gate member for bracing the preset number of coupons as the blade is moving into the stack, said gate being movable out of the path of the blade to permit the coupons to be moved into registry with said panel;

means for moving said preset number of "take-one" coupons to a position in overlying registry with said panel when said panel is at the predetermined point;

means for fastening said preset number of coupons to said panel in a manner permitting ready manual removal of individual ones thereof; and

means for synchronizing the operation of said coupon moving and fastening means with each other and with said means for moving said panels to enable assembly of said coupons to said support panel in desired registration.

4,068,836

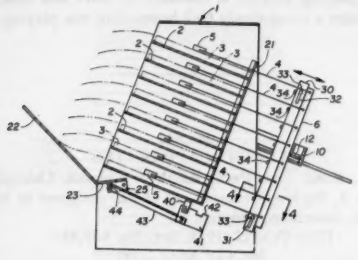
MANUAL PAPER COLLATOR

George H. Dimopoulos, Park Ridge, Ill., assignor to Michael Business Machines Corporation, New York, N.Y.

Filed June 9, 1976, Ser. No. 694,233
Int. Cl.[2] B65H *39/05*
U.S. Cl. 270—58 **8 Claims**

7. A manually operable collator for simultaneously gathering multiple sheets of paper comprising, in combination, a plurality of trays for receiving and storing stacks of paper sheets arranged according to a desired sequence of assembly; means for simultaneously transporting the top sheet of paper from each tray having elongated pivotally mounted pusher means extending into each of said trays to engage said top sheets of paper; adjustable guide means disposed adjacent said trays and pivotally movable between a paper loading position and a plurality of paper guiding positions in which said guide means is adapted to receive and converge the leading edges of the transported paper sheets to facilitate the gathering thereof;

and means operatively linked to the guide means and the pusher means for pivotally lifting said pusher means out of



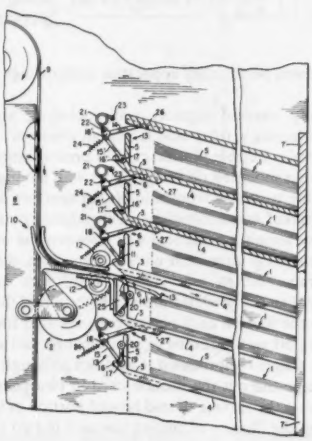
engagement with said top sheets of paper when the guide means is moved to the paper loading position.

4,068,837

PAPER HOLD-DOWN DEVICE FOR COLLECTOR

Richard Allen Lamos, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,872
Int. Cl.[2] B65H *31/26, 31/24*
U.S. Cl. 271—173 **9 Claims**



9. In a sheet collecting and stacking apparatus having support means for collecting a plurality of sheets in stacked relation, an entrance at one side of said support means, and feeding means for feeding sheets through said entrance and into superimposed relation with previous sheets stacked on said support means, said feeding means being mounted for movement from a first position out of alignment with said entrance to a second position aligned with said entrance when a sheet is to be fed therethrough, and improved sheet hold-down device for holding the trailing edge of the sheets of the stack down at said entrance to prevent obstruction thereof and permit feeding of the next sheet therethrough and into said superimposed relation with said stack, said hold-down device comprising:

a. a sheet hold-down arm;

b. support means for supporting the holddown arm for movement between a first standby position spaced from the trailing edge of the stack and a second operative position disposed in overlying relation with the trailing edge of the stack and in underlying relation to the path of feeding of the next sheet onto said stack; and

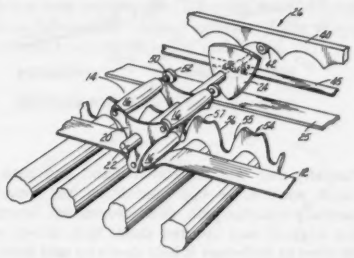
c. actuator means including means responsive to movement of said feeding means into its second position to actuate said hold-down arm and cause movement thereof from said first position to said second position as said feeding means moves into its second position.

4,068,838

CONVEYOR AND THREE-ROLLER SHEET DEFLECTOR FOR SHEET DISTRIBUTOR

Henricus J. Anbergen, Arlon, Belgium, and Peter McCabe, Godalming, England, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed July 28, 1976, Ser. No. 708,854
Int. Cl.[2] B65H *29/60*
U.S. Cl. 271—173 **5 Claims**



1. A sheet distributor, comprising:

a plurality of spaced conveyor bed members aligned to define an elongated transport path in a plane tangent to the spaced members, the space between the members being gates from the transport path;

at least one belt web traveling about end guides of fixed position, resting on the bed members and bridging the spaces therebetween to clamp sheets between said belt and the conveyor bed members;

drive means for driving said belt web in a conveying direction to convey sheets along the transport path;

a three-roller deflector assembly with the rollers thereof spaced in equiangular relationship;

means for revolving and advancing the assembly along said path over said belt web;

means to guide said assembly in a cyclic path which causes the assembly to plunge one roller fully into one said space until the belt is contained without appreciable slack in its path, and thereafter pivot about that one roller as it remains in position until a subsequent roller is brought into contact with the belt at the subsequent space, whereafter the one roller is retracted at a rate equal to the rate of insertion of the subsequent roller, whereby, the belt is maintained deflected for an extended period of time in each space and the belt is never permitted to become slack.

4,068,839

SHEET STACKING APPARATUS

Michael Kermit Bullock; Sherwood Anderson Clay, and Gregory Bingham Overton, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 4, 1977, Ser. No. 774,579
Int. Cl.[2] B65H *29/44*
U.S. Cl. 271—180 **15 Claims**

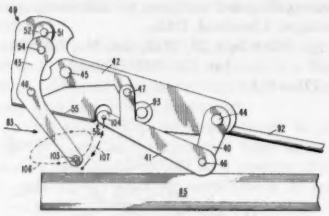
1. Sheet hold-down apparatus for use in stacking flexible sheets in a substantially fixed-position horizontal plane from a substantially fixed-position sheet entrance path, the apparatus comprising:

a hold-down bar and a pusher bar having quiescent positions wherein said hold-down bar resides substantially in said horizontal plane, and operates to hold down the trailing edge portion of sheets within a stack, and wherein said pusher bar is positioned a distance above said horizontal

plane, the space between said bars defining an unobstructed entrance for the insertion of a sheet;

sensing means responsive to the insertion of a sheet; and

motive means controlled by said sensing means and operative to produce synchronized substantially vertical movement of said pusher bar down onto said inserted sheet and



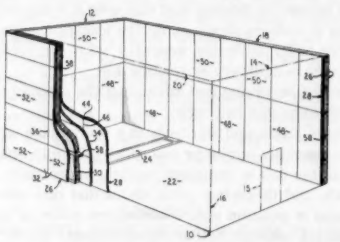
substantially into said horizontal plane, and back to its quiescent position, as said hold-down bar moves in a substantially circular path, first toward and beyond the trailing edge of said inserted sheet, then above said inserted sheet as said sheet is held down by said pusher bar, and then back to its quiescent position.

4,068,840

PLAYING SURFACE FOR HANDBALL AND RACQUETBALL COURTS

Charles A. Spaulding, Jr., 13600 Clayton Road, Manchester, Mo. 63011

Filed Aug. 9, 1976, Ser. No. 712,672
Int. Cl.[2] A63B *71/04;* B32B *3/26*
U.S. Cl. 272—3 **5 Claims**



1. In a court for handball or racquetball or the like, where a playing surface is presented by a panel structure that includes a relatively thick, base sandwich panel member having a foam core interposed between opposed sheets for imparting the desired bounce to a ball played off the panel structure, said base panel member including a plurality of panel elements thereof joined in edge-to-edge relationship, the improvement in said panel structure comprising:

a thin finish panel member on said base member in direct surface contact therewith, said finish member including a layer of impact-resistant material faced with a smooth, hard, impact-resistant skin bonded to said layer and presenting an outer playing surface characterized by durability and hardness,

said finish member further including a plurality of panel sections thereof presenting respective portions of said playing surface; and

means for joining said panel sections, during on-site construction of the composite panel structure, in edge-to-edge relationship with the respective surface portions thereof in planar alignment,

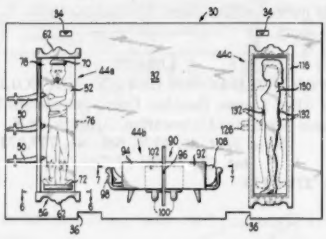
the lines of joinder of the elements of a planar expanse of said base member being substantially out of alignment with the lines of joinder of the sections of the finish member thereon, whereby the resultant, comparatively inexpensive playing surface is resistant to mars and dents and provides a consistently true bounce for the playing ball.

4,068,841

ILLUSION APPARATUS

Wayne A. Kuna, Oak Park; Ralph J. Kulesza, Chicago, and Gordon A. Barlow, Evanston, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 12, 1976, Ser. No. 657,643
Int. Cl.[2] A63J *5/00*
U.S. Cl. 272—8 R **3 Claims**



1. An illusion performing apparatus, comprising:

a base;

a generally vertical support wall including an aperture therein having a front side facing an observer;

a substantially flexible illusion card of predetermined length;

frame means mounted on said support wall having a portion extending over said front side of said aperture beyond the ends thereof and concealing a substantial portion of said aperture forming a vertical slot between the ends of the frame means in alignment with said aperture, the length of said frame means between its respective ends being smaller than the predetermined length of said illusion card so that the illusion card placed between said frame means and support wall is forced to bow through said aperture so that an article reciprocated in said slot although appearing to engage and cut the illusion card in two portions actually clears the surface of said bowed portion of the card to perform the illusion of cutting the card in two parts while actually not doing so.

4,068,842

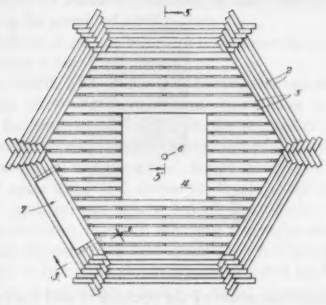
CHILD RECREATION STRUCTURE

Robert L. Callecod, Long Lake, Minn., assignor to Recreation Systems Co., North Aurora, Ill.

Filed June 4, 1976, Ser. No. 693,014
Int. Cl.[2] A63B *9/00*
U.S. Cl. 272—113 **2 Claims**

1. A child recreation structure comprising at least four side walls arranged to form a polygonal enclosure, each of said walls comprising spaced horizontal rails each of which rests upon and extends beyond a rail of adjoining sides, said walls inclining inwardly, a horizontal platform for supporting a user of the structure at the uppermost limit of the walls and, spanning the area defined by the tops of all of said walls, said having a central opening therein, and a vertical pole mounted and arranged at approximately the center of said opening and extending above said platform of sliding from said platform

down into the interior of said structure, said pole being completely unsupported by the walls and the platform, one of said



walls having an open doorway therein to permit passage therethrough by a user of the structure.

4,068,843

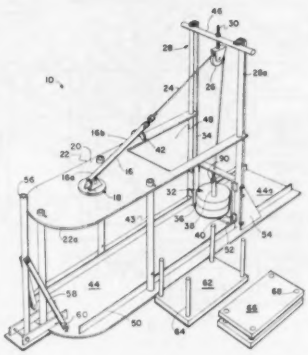
HEAVY-DUTY SWIVEL ARM-WRESTLER AND EXERCISER

Donald L. Frost, 322 N. Marlyn Ave., Baltimore, Md. 21221

Filed June 25, 1976, Ser. No. 699,863

Int. Cl.[2] A63B *21/06*

U.S. Cl. 272—118 **13 Claims**



1. Arm wrestling practice apparatus comprising: an arm having first and second ends, a table having first and second portions, means hindgedly connecting the first end of the arm to the table and for rotatably mounting the first end of the arm to permit rotation of the arm in a plane substantially parallel to the plane of the table, and means biasing the second end of the arm in a direction relative to the table providing resistance to said pressing over of the arm.

4,068,844

METHOD AND APPARATUS FOR A GAME

Gary J. Tempel, 1208 Cottage Road, Webster City, Iowa 50595

Filed Dec. 2, 1976, Ser. No. 747,074

Int. Cl.[2] A63F *9/00*

U.S. Cl. 273—1 R **1 Claim**

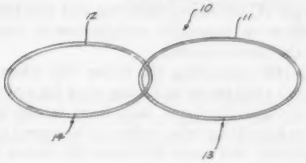
1. A method of performing a game with apparatus including:

a first annular member, said first annular member having a first end and a second end, said first and second ends having openings therein;

first connection means for connecting said first and second ends of said first annular member comprising a member having a shape complementary to the openings in said first and second ends and positioned in frictional engagement within said first and second openings whereby said first and second ends are held together, but allowing said first and second ends to be separated when sufficient force is applied to said first annular member;

a second annular member in interlocking engagement with said first annular member, said second annular member having a third end and a fourth end, said third and fourth ends having openings therein;

second connection means for connecting said third and fourth ends of said second annular member comprising a member having a shape complementary to the openings in said third and fourth ends of said second annular member and positioned in firm frictional engagement within said third and fourth openings whereby said third and fourth ends are held together, but allowing said third and fourth ends to be separated when sufficient force is applied to said second annular member; and



wherein said second annular member is smaller than said first annular member thereby allowing said second annular member to pass through said first annular member from one side of said first annular member to the other side of said first annular member, said first and second members being larger in diameter than the average size of a human head; said method comprising:

placing the first annular member around the neck of a first person;

placing the second annular member around the neck of a second person; and

switching the first and second annular members whereby the first annular member is around the neck of a second person and the second annular member is around the neck of the first person, said switching being performed solely by said first and second persons without the use of their hands.

4,068,845

BOWLING PIN POSITIONING APPARATUS

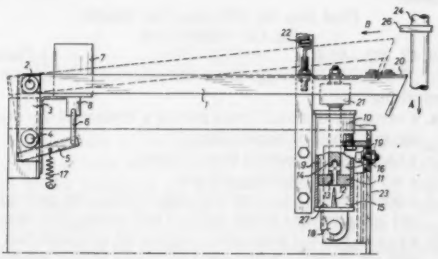
August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs-und Finanzierungsgesellschaft, Serania AG, Glarus, Switzerland

Filed May 11, 1976, Ser. No. 685,308

Claims priority, application Switzerland, May 30, 1975, 6982/75

Int. Cl.[2] A63D *5/08*

U.S. Cl. 273—42 A **7 Claims**



1. Bowling pin positioning arrangement having a vertically

movable frame (28) adapted to receive and place bowling pins (40) on the surface (46) of a bowling alley;

means (48, 49) coupled to the frame moving the frame downwardly and upwardly through a stroke extending between top and bottom limiting position comprising

a crank arm (49) and a chain (48) supporting the frame (28) and, upon rotation of the crank arm, suspending the frame (28) for vertical movement;

and a stroke limiting means to decrease the length of the stroke of movement in downward direction including

an abutment element (26) secured to said frame,

a movable control and limit level (1) selectively positionable in interfering or non-interfering relation with respect to the abutment element (26) to control movement of the frame (28), said abutment element (26) being supported by the control and limit lever (1) when in interfering position to, in turn, support said frame;

an electromagnet (7) coupled to and moving the control and limit lever (1) between interfering and non-interfering in dependence on respective energization or non-energization of the electromagnet;

said chain (48) suspending the frame (28) when the frame carries out a full stroke and being slack for a portion of the stroke if the control and limit lever is selectively positioned in interfering relationship with respect to the abutment element, and hence the frame (28) during a complete rotation of the crank (49), to control the stroke length of the frame (28) independently of the rotation of the crank (49);

and a damping dashpot (10) operably connected to the control and limit lever (1) to dampen movement of the frame (28) when the limit lever (1) is positioned in interfering relation with respect to the movement of the frame (28),

said dashpot being a hydraulic dashpot (10) and comprising a cylinder-piston combination (9, 11), the piston being formed with a fluid passage (13) therethrough, the piston (11) subdividing the cylinder (9) into two chambers (15, 16)

and a conical pin (13) located within the cylinder (9) and in alignment with the fluid passage (13), located in position to penetrate the fluid passage upon movement of the piston (11) in the cylinder to decrease the cross-sectional flow area available for fluid flow from one chamber into the other through said fluid passage (13) thereby progressively throttling said fluid flow and increasingly braking movement of said limit lever and hence of the frame (28), the piston (11) engaging the bottom wall (27) of the lower chamber (15) of the dashpot when the piston (11) reaches its limiting position to support the piston, and hence to control and limit lever (1) and thereby the frame (28) if the control and limit lever was in interfering position with respect to the frame.

4,068,846

PLACE-KICKING FOOTBALL RECEIVING TARGET

Charles Phelps Forrest, 1306 St. Stephens Road, Mobile, Ala. 36603

Filed July 26, 1976, Ser. No. 709,004
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—55 B **13 Claims**

1. A football receiving target for practicing placekicking comprising:

a. a vertically disposed frame having a horizontal top cross bar and a pair of vertical legs;

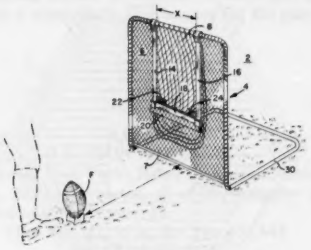
b. a backstop net secured to said frame;

c. a rectangular cutout in said net;

d. a pocket having an open end and a closed end, said open end being secured to the edges of said rectangular cutout;

e. a pair of vertical straps and a horizontal strap attached to said net outlining said open end of said pocket whereby said attached straps simulate a football goalpost; and

f. a pair of auxiliary straps removalbly attachable to said horizontal top bar of said frame and to said horizontal strap, said auxiliary straps being attachable parallel to said



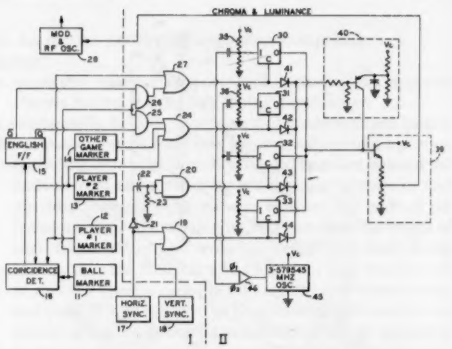
vertical straps whereby the opening of said pocket may be limited for practicing field goals from different distances.

4,068,847

CHROMA AND LUMINANCE SIGNAL GENERATOR FOR VIDEO GAMES

Jeffrey Reed Lukkarila, and Kenneth D. Liston, Jr., both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed June 23, 1976, Ser. No. 699,127
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—85 R **7 Claims**



1. In a video game, having a game marker generator for generating a video signal for representing a game marker to be displayed on a television receiver, a luminance and chroma signal generator comprising:

a. an oscillator means having a signal at a frequency of substantially 3.579545 MHz;

b. means for combining said oscillator signal with a d.c. voltage, said d.c. voltage representing a luminance level; and

c. means for switching said combined oscillator signal and d.c. voltage combination in response to said video signal whereby said switched signal comprises a chroma and luminance signal.

4,068,848

PROFESSIONAL MALPRACTICE BOARD GAME APPARATUS

Allan S. Lichtman, 18370 Burbank Blvd., Tarzana, Calif. 91358, and Rosemary R. Lichtman, 22448 Calipatria Drive, Woodland Hills, Calif. 91364

Filed Jan. 26, 1976, Ser. No. 652,555
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—257 **8 Claims**

1. Means to play an adult game based upon possible legal and

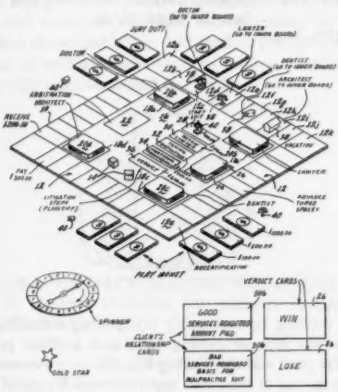
business activities and possible experiences of persons in selected professions, said means comprising:

a. a plurality of movable elements, at least one of said elements to be provided each player;

b. means for each player, when his turn comes up, to develop by chance a numerical factor;

c. a first board, said first board having defined thereon a plurality of consecutive spaces constituting a path of travel for said movable elements, the number of spaces to be traveled by each element at the turn of its player, being determined by the numerical factor developed by such player upon using said means to develop said numerical factor; each of said spaces having instructions thereon, said instructions either (i) affecting the movement of the movable element over said spaces; (ii) providing for the payment to or by the player whose elements land on such space, of money in an amount as stated on such space; or (iii) directing the player to proceed to a second board for instructions;

d. a second board, said second board having defined thereon a number of first spaces, one of each of said first spaces



being provided for each of the selected professions, and a plurality of second spaces, each of said second spaces constituting a step in a legal proceeding and indicating the amount of money to be paid by the plaintiff in said proceeding with each step of the litigation;

e. a plurality of groups of first cards, each group of said first cards providing information either good or bad, concerning a client's relationship with the person of the particular one of said professions and, on the basis thereof, if good, indicating the amount of money to be paid by such client and returning the player to his position on the first board for further movement of his element on the spaces of the first board; or, if bad, providing a basis for a malpractice suit and the formula for a possible monetary recovery against the professional person if a suit should be brought against the latter, or an arbitration thereof conducted, with a successful result;

f. a plurality of second cards, said second cards being verdict cards, some of which represent positive votes for recovery against the defendant and others negatives votes denying recovery to the plaintiff; and

g. play money in various denominations.

4,068,849

SOLID GOLF BALL

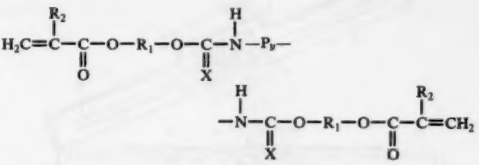
Gail D. DiSalvo, Scotch Plains, N.J., and Raymond A. Berard, Portsmouth, R.I., assignors to Acushnet Company, New Bedford, Mass.

Filed Mar. 21, 1975, Ser. No. 560,868

Int. Cl.[2] C08L *15/00*

U.S. Cl. 273—218 **9 Claims**

1. A golf ball comprising at least in part a polymerized unsaturated elastomer said polymerized unsaturated elastomer being cross linked by a compound having the formula:



wherein:

R_1 is any divalent, aliphatic, or cycloaliphatic moiety of up to about 20 carbon atoms or mixtures thereof including heteroatom substituted aliphatic or cycloaliphatic moieties;

R_2 is hydrogen or an alkyl group having up to about 5 carbon atoms;

P_y is an aliphatic, cycloaliphatic or aromatic moiety of from about 5 to about 20 carbon atoms or is $R_3—P_z—R_4$ wherein:

R_3 is an aliphatic, cycloaliphatic or aromatic moiety of from about 5 to about 20 carbon atoms;

R_4 is an aliphatic, cycloaliphatic or aromatic moiety of from about 5 to about 20 carbon atoms;

P_z is an organic polymeric segment selected from the group consisting of polyurethanes, polyureas, polyethers, and polyesters and has a molecular weight of from about 500 to about 5,000.

X is oxygen or sulfur.

4,068,850

STYLUS UNIT FOR PICK-UPS AND/OR CUTTERS

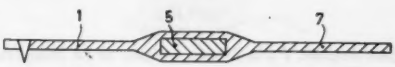
Elzo Smit, and Keimpe van Wijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 560,162, March 20, 1975, abandoned. This application July 20, 1976, Ser. No. 707,036

Claims priority, application Netherlands, Apr. 1, 1974, 7404360

Int. Cl.[2] G11B *3/46*

U.S. Cl. 274—37 **8 Claims**



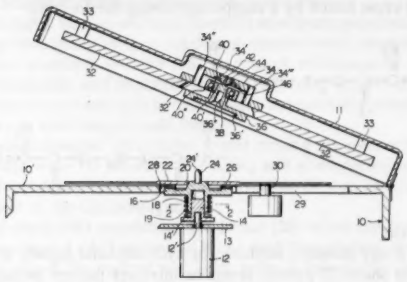
1. A stylus unit of the type used for grooved recordings, comprising a stylus, a stylus holder and a magnet, wherein the stylus holder comprises an elongated unitary mass of reinforced plastic material having a center portion, a first end portion, and a second end portion; said first end portion having a hole for holding the stylus, said stylus being fitted directly in said hole, said center portion having a cavity, said magnet being embedded in said cavity, said second end portion of said mass forming a locating wire.

4,068,851

AUDIO/VIDEO DISC PLAYBACK APPARATUS WITH MEANS FOR CORRECTLY POSITIONING THE DISC RELATIVE TO A REFERENCE LEVEL

Takashi Yamamura, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Jan. 21, 1977, Ser. No. 760,984
Claims priority, application Japan, Jan. 23, 1976, 51-6656
Int. Cl.² G11B *3/60*
U.S. Cl. 274—39 A **11 Claims**



1. An audio-video disc playback apparatus, comprising:
a housing;
a cover hinged to said housing and rotatable between open and closed positions relative to said housing;
a rotary drive shaft rotatably mounted in said housing;
a rotor disc for mounting an audio-video disc and having a tapered portion for engagement with the center hole of the audio-video disc;
a stationary disc having a diameter equal to or greater than the diameter of said audio-video disc and mounted on the under side of the cover and having an opening at the center thereof;
a pressure disc;
one of the rotor and pressure discs having a guide shaft and the other of the rotor and pressure discs being provided with a bore for receiving said guide shaft when the cover is in the closed position;
a bearing having an inner race coupled to the pressure disc for rotation therewith and an outer race;
means for mounting the pressure disc in the opening of the stationary disc when the cover is in the closed position; and
means engageable with the mounting means for suspending the pressure disc from said mounting means when the cover is in the open position and disengageable from the mounting means for enabling said guide shaft to be received in said bore to coaxially align the rotor disc and the pressure disc when the cover is in the closed position while engaging the outer race of the bearing with the mounting means so that the audio-video disc is under pressure between the pressure disc and the rotor disc.

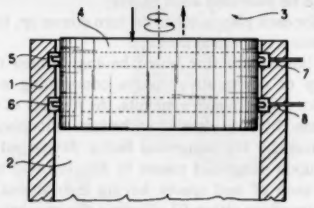
4,068,852

SEAL RING

Jacques Anglade, Paris, France, assignor to Le Joint Francais, Paris, France

Filed Dec. 5, 1975, Ser. No. 638,214
Claims priority, application France, Dec. 19, 1974, 74 42073
Int. Cl.² F16J *15/46*
U.S. Cl. 277—34.3 **6 Claims**

1. Seal ring made of an elastomeric material intended to operate at a temperature at least equal to 150° C and to be in contact on its opposite sides with two gaseous fluids, one of which at least is a fluid emitting nuclear radiations, and to be able to slide with a very slight friction coefficient in contact with a body which rotates and/or moves in a linear direction, comprising an outer casing made of an elastomer which is resistant to heat and to nuclear radiations and has a low friction coefficient, an inner casing made of a heat resistant elastomer, and an intermediate casing closely welded to both said outer



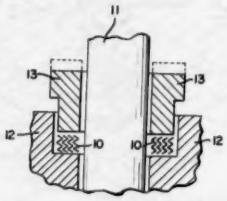
casing and said inner casing, said seal ring being filled with a gas at a relatively low pressure and said inner casing being impermeable to said gas.

4,068,853

STUFFING BOX SEAL

Danny Louis Schnitzler, North Ridgeville, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 618,064, Sept. 30, 1975, abandoned, which is a continuation of Ser. No. 354,318, April 25, 1973, abandoned. This application July 27, 1976, Ser. No. 709,211
Int. Cl.² F16J *15/16*
U.S. Cl. 277—102 **5 Claims**



1. In a stuffing box assembly comprising a stuffing box, a shaft disposed in said stuffing box, and a gland positioned between the shaft and the stuffing box, the improvement which comprises having at least two superimposed layers of a corrugated expanded graphite tape wrapped about the portion of said shaft disposed in the stuffing box, the corrugations of said expanded graphite tape running transverse to the length of the tape and the superimposed layers of said expanded graphite having multiple zig-zag interlocking folds along their lengths and forming an interference fit between the shaft and the stuffing box as a result of compression by the gland parallel to the direction of the corrugations.

4,068,854

DUST SEAL FOR ROTATABLE SHAFT PASSING THROUGH A BIN WALL

Edward T. Douglass, Jr., 14 Clubview Drive, Birmingham, Ala. 35222

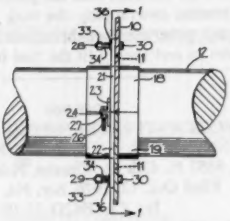
Filed Jan. 6, 1977, Ser. No. 757,446
Int. Cl.² B65D *53/02*
U.S. Cl. 277—237 A **1 Claim**

1. In a dust seal for use between a rotatable shaft and a passageway through a bin wall through which said shaft extends with said bin wall being divided along a generally horizontal line into upper and lower sections,
a. a split sleeve having at least two adjacent sections adapted to surround said shaft with a snug, rotatable fit,
b. a plate-like section carried by each section of said split sleeve and extending laterally therefrom with adjacent edges of adjacent platelike sections abutting each other along the line dividing the bin wall into upper and lower

sections and defining a composite plate of a size and shape to completely surround said passageway through the bin wall and overlie the adjacent portion of said bin wall surrounding said passageway,

c. means securing said adjacent plate-like sections to each other to provide a dust-tight connection therebetween,

d. at least two threaded members carried by said adjacent portion of said bin wall and extending outwardly therefrom toward said plate-like sections, and



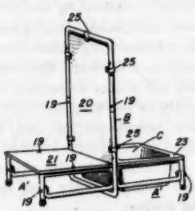
e. elongated slots in said plate-like sections in position to receive said threaded members with each said elongated slot being of a width and length greater than the diameter of said threaded members and extending in horizontal planes above and below said shaft to permit lateral adjustment of said plate-like sections both vertically and horizontally relative to said bin wall.

4,068,855

GRAPHIC MERCHANDISING GONDOLA

Robert H. Hackett, Oakmont, Pa., assignor to IDL Incorporated, Pittsburgh, Pa.

Filed June 3, 1976, Ser. No. 692,345
Int. Cl.² B62D *53/06*
U.S. Cl. 280—79.3 **22 Claims**



1. In an improved merchandising gondola for mounting on a floor, a unitary frame structure of tubular construction having a horizontally extending floor-positioned bottom support frame of step-like construction and a backwardly positioned upright display frame, a cross-extending glide member in alignment with and connected to a lower end portion of said upright display frame and downwardly with respect to said bottom frame for engagement with the floor, and casters extending downwardly from said bottom frame in a forwardly spaced-apart relation with respect to said glide member for engaging the floor and with said glide member for retaining said frame structure in a stable easily moved position on the floor at which said upright frame is in a substantially straight vertically extending relation.

4,068,856

SAFETY SPARE TIRE LOCKING BOLT

Herbert Harris, 1828 - 4th St., Washington, D.C. 20001

Filed Aug. 8, 1967, Ser. No. 667,616
Int. Cl.² B62D *43/00*
U.S. Cl. 280—179 R **1 Claim**

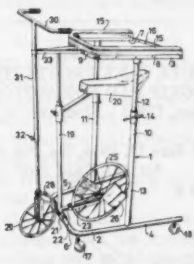
1. A spare tire holding and locking device comprising; a padlock having a shackle, a shaft bent at its lower end to hook under a bracket on a flat interior surface of an automobile trunk, said shaft having a straight portion for extending through a bolt hole in a spare tire wheel when the tire is flat against said surface, said straight portion including an upper portion of increased diameter which has a crosshold formed therethrough removably receiving the padlock shackle, said upper portion being threaded at its end for receiving a washer and threaded nut for the purpose of protecting and concealing the padlock.

4,068,857

APPARATUS ENABLING DISABLED PERSONS TO MOVE INDEPENDENTLY

Sven Arne Lennart Karlsson, Box 4, S-570 81 Jarnforsen, Sweden

Filed Apr. 30, 1975, Ser. No. 573,081
Claims priority, application Sweden, Apr. 30, 1974, 7405830
Int. Cl.² B62M *1/02*
U.S. Cl. 280—259 **1 Claim**



1. An apparatus for the independent movement and exercise of disabled persons comprising a wheel supported frame including a lower horizontal frame member, an upper frame member substantially parallel to, but spaced from said lower frame member, vertically extending posts connecting said frame members, a wheel being pivotally connected to and extending forwardly of said lower frame member, a steering bar being operatively connected to said wheel, a driving wheel provided with pedals, being rotatably connected to and extending within said lower frame member, said lower frame member and said upper frame member each being U-shaped

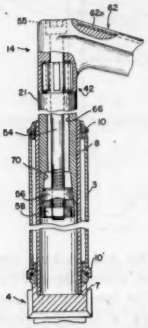
having two legs diverging from a waist portion connecting said legs, a vertical saddle post extending from the central waist portion of said lower frame member and a saddle adjustably mounted on said saddle post.

4,068,858

BICYCLE

George Harrison, Berwyn, and Nelson Harrison, Riverside, both of Ill., assignors to Nelson K. Harrison, Berwyn, Ill.

Filed Jan. 9, 1976, Ser. No. 647,912
Int. Cl.[2] B62N *00/00*
U.S. Cl. 280—289 R **9 Claims**



1. A bicycle including a wheeled frame, front wheel assembly pivotally connected to the frame, handlebar means for grasping by the operator, a handlebar mounting member keyed to the front wheel assembly and to which the handlebar means is secured for steering the bicycle, the improvement wherein:

a. said member includes a bar portion formed with an opening recess,

b. an identification plate fixedly inset in said recess and bearing identification indicia on its outwardly facing side,

c. said recess defining a floor surface covered by said plate and said floor surface bearing identification data,

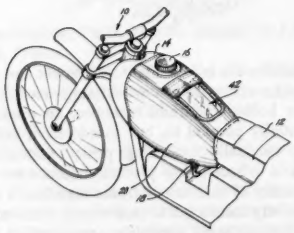
d. said plate side and the surrounding bar surface being subjected to mutilation by efforts to tamper with said plate indicia, and said plate side and the bar surface surrounding it are disposed on the bicycle such that when the bicycle is parked upright, said plate side and its surrounding surface present themselves for ready inspection for detection of such mutilation.

4,068,859

COMBINED FUEL TANK PROTECTIVE COVER AND THIGH GRIP PAD FOR MOTORCYCLES

Melvin M. Dittman, 17513 - 32nd Ave. W., Lynnwood, Wash. 98036

Filed June 11, 1976, Ser. No. 695,264
Int. Cl.[2] B62J *7/00*
U.S. Cl. 280—289 E **9 Claims**



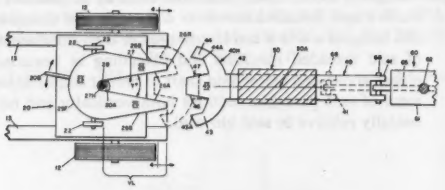
1. A combined protective cover and rider's leg grip pad device for removable mounting on a motorcycle fuel tank having contiguous top, sides and bottom exterior surfaces extending forwardly from the motorcycle rider's seat, said cover and grip pad device comprising a pad panel member of flexible and elastically stretchable sheet material having a transverse span between opposite side edges to permit drawing such edges transversely inward into mutual proximity beneath the tank with said panel member draped transversely over and enwrapping said tank, and fastener means for removably interconnecting said opposite edges extending inwardly into mutual proximity beneath the tank with the panel member maintained thereby in tension enwrapping the tank and stretched transversely of such panel member througout the length thereof so as to conform to and snugly fit the fuel tank.

4,068,860

TRAILER ANTI-JACKKNIFING APPARATUS

William G. Meyers, R.R. #1, Gretna, Nebr. 68028, and Arthur A. Dirks, 5357 N. 47th St., Omaha, Nebr. 68104

Filed Oct. 12, 1976, Ser. No. 731,308
Int. Cl.[2] B62D *53/08*
U.S. Cl. 280—432 **8 Claims**



1. Trailer anti-jackknifing apparatus in combination with a conventional tractor-drawn trailer wherein the tractor includes a forward operator's cab and a rearward skid-plate comprising a generally circular forward portion and a pair of longitudinally horizontally rearwardly extending guide-lugs having rearwardly divergent upright inward-sides terminating at transversely opposed rear-tips to provide an elongate V-slot forwardly converging for a longitudinal finite-length from the rear-tips to a secureable kingpin at the tractor-to-trailer vertical pivot-axis, the outside contour of the skid-plate being geometrically symmetrical and having an upright outward-side, the trailer longitudinally extending underside carrying a depending kingpin, said anti-jackknifing apparatus comprising:

A. a generally horizontal longitudinally extending elongate ram terminating as a forward head-end, said ram being located beneath the trailer underside and attached to the trailer rearwardly of the kingpin, said ram head-end having an inactive normal-station and an anti-jackknifing extended-station respectively located rearwardly most remote from and nearer to the skid-plate, said ram at extended-station being rigidly and non-pivotably associated with the trailer;

B. a sturdy header rigidly attached to and co-reciprocatable with the ram head-end, said header including a pair of co-elevational forwardly extending horizontal arms which diverge outwardly away from the ram head-end and also a forwardly extending horizontal tongue having a pair of upright faces disposed between said arms, the inside contour of the header being geometrically symmetrical with respect to the trailer longitudinal-axis whereby at ram extended-station at least one of the header arms and also a tongue upright face during trailer swerving about the kingpin are adapted to simultaneously engage an outward side and an inward side of the skid-plate guide-lug, and

C. actuation means for causing the ram and its rigidly attached forward header to reciprocate between normal-station and extended-station, the ram actuation means includ-

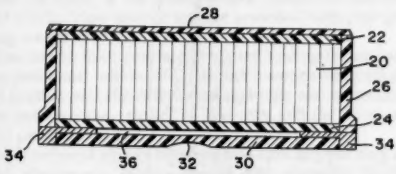
ing control means located within the tractor operator's cab and hence forwardly remote from the skid-plate.

4,068,861

LIGHTWEIGHT, FLEXIBLE SKI

Hubert R. Zemke, Jr., Danville, Calif., assignor to Hexcel Corporation, San Francisco, Calif.

Filed Feb. 26, 1976, Ser. No. 661,506
Int. Cl.² A63C *5/04*
U.S. Cl. 280—610 **1 Claim**



1. A lightweight, flexible ski comprising:

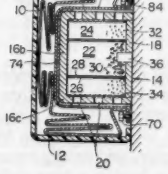
a honeycomb sandwich defined by an open celled core having a ribbon direction parallel to the ski length, having facings bonded to the top and bottom portion of the core, said facings being comprised of a multiplicity of substantially straight, parallel fibers extending over the length of the core, and said core having flexible sidewalls bonded directly to said core, said sidewalls comprising sheets of rubberized thermoplastic material with a modulus of about 2×10^3 psi; a running surface beneath said bottom facings and having at least one of its running edges formed from a flexible metallic strip, and said strip comprising an elongated, one-piece metal body having a plurality of laterally extending gaps transverse to its running edge to form a plurality of running edge segments, said segments having interconnecting means integral with adjacent running edge segments and said interconnecting means being less than one-half the thickness of the running edge segments whereby the ski exhibits high longitudinal and sidewall deflection.

4,068,862

SAFETY BAG INFLATION APPARATUS WITH EXTENDIBLE GUARD MEMBER AGAINST CONTACT OF BAG WITH HEATED GAS GENERATOR

Takashi Ishi, Sayama; Takuzi Murakami, Tokorozawa; Masayoshi Kato, Shiki, and Tadahiko Nagaoka, Tokorozawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 10, 1975, Ser. No. 621,603
Claims priority, application Japan, Nov. 20, 1974, 49-133866; Apr. 30, 1975, 50-59155[U]; May 24, 1975, 50-69884[U]
Int. Cl.² B60R *21/08*
U.S. Cl. 280—740 **6 Claims**



1. A safety apparatus comprising:

a gas generator including a housing with a plurality of gas outlets formed in a wall thereof, a combustible gas-generating composition disposed in said housing, and a heat-absorbing material disposed in said housing between said gas generating composition and said outlets;

an inflatable bag folded and arranged such that said housing extends into said bag, the mouth of said bag being in a fixed position with respect to said housing, so that said bag is inflated when a gas is discharged from said outlets; and

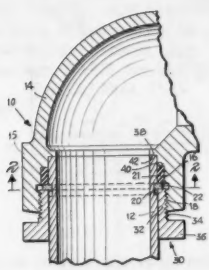
a guard member fixedly arranged between said housing and said bag, said guard member having a hollow shape generally similar to and slightly larger than the exterior of said housing, a plurality of slits formed in a wall of said guard member overlying said outlets, said slits being separated by portions of said guard member which expanded outwardly, enlarging said slits, when gases are discharged from said outlets.

4,068,863

PIPE JOINT

John A. Lasko, 50 Notch Hill Road, North Branford, Conn. 06471

Filed Oct. 14, 1976, Ser. No. 732,427
Int. Cl.² F16L *19/00*
U.S. Cl. 285—39 **1 Claim**



1. A mechanical pipe joint comprising, in combination:

a. a length of metal pipe having an annular external groove in said pipe axially spaced from one end thereof

b. a compression ring disposed in said annular groove,

c. a cylindrical compressible packing ring surrounding the end portion of the pipe between the substantially radial end surface of the pipe and said compression ring, adapted for engagement by the latter,

d. a companion pipe fitting part having a bore in which the pipe end, the compressible packing ring and the compression ring are received, said bore having a first substantially radial shoulder for engagement with the substantially radial end surface of the pipe, said bore having a second substantially radial shoulder and a cylindrical portion adjacent said second shoulder, said packing ring having a substantially radial end surface in abutment with said second shoulder and an external cylindrical surface engaging said cylindrical portion,

e. said bore of the companion fitting part having internal screw threads, and

f. a compression nut comprising a sleeve having external screw threads engaged with the internal threads of the companion pipe fitting part and having means engageable by a wrench for applying a turning movement to it, thereby to screw the sleeve into the campanion pipe fitting part, said sleeve having an inner substantially radial end surface engageable with the compression ring whereby the pipe end can be brought up snug against its cooperable first shoulder in the fitting part through the intermediary of the compression ring, said ring simultaneously exerting a compression force on the packing ring tending to bulge the latter and effect a tight seal between the companion pipe fitting part and the pipe end portion,

g. said compression ring being split, forming two end portions juxtaposed to one another, thereby enabling the ring

to be spread an extent during its installation in the annular groove,

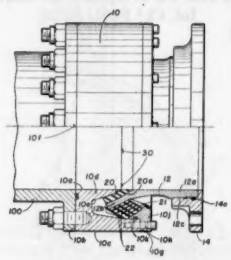
h. said groove having a width measured axially of the pipe, which is substantially greater than the thickness of said compression ring and on the order of roughly twice said thickness whereby the ring can shift axially on the pipe within limits determined by the engagement of the opposite sides of said ring with the opposite walls respectively of said groove so as to facilitate starting of the nut in the bore of the companion pipe fitting part.

4,068,864

SINGLE ELEMENT FLEXIBLE CONNECTION

John T. Herbert; Frank J. Kovitch, both of Arlington; Paul E. Sullivan, Euless, all of Tex., and Stanley P. Vitt, Redlands, Calif., assignors to Murdock Machine & Engineering Company, Irving, Tex.

Filed June 30, 1976, Ser. No. 701,088
Int. Cl.[2] F16L *11/12*
U.S. Cl. 285—49 **14 Claims**



1. In a flexible joint for pipelines where an annular housing with a central cavity has a nipple partially submerged therein with said nipple having a flared end on the submerged portion, the combination which comprises:

a. an elastomeric ring adhered to the inner surface of said flared end and internally contoured spherically with reference to a common center point spaced from said flared end and located on the longitudinal axis of said joint,

b. an elastomeric body having an assembly of concentric spherical rings embedded therein, with said body adhered to the outer surface of said flared end and with said rings contoured and positioned in symmetry to said common center point,

c. a collar encircling said nipple and engaging the outer surface of said elastomeric body to maintain said body in position,

d. support structure in said housing having an outward facing spherical surface mating in sliding relation with the internal surface of said elastomeric ring, and

e. means to secure said collar to said housing.

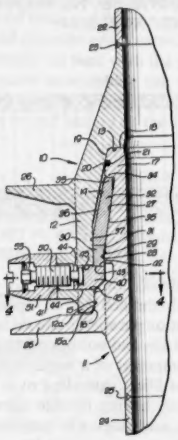
4,068,865

PIPE CONNECTORS

Forrest E. Shanks, II, Farmers Branch, Tex., assignor to Vetco Offshore, Inc., Ventura, Calif.

Continuation-in-part of Ser. No. 644,719, Dec. 29, 1975, abandoned. This application July 28, 1976, Ser. No. 709,274
Int. Cl.[2] F16L *21/00*
U.S. Cl. 285—90 **23 Claims**

1. A connector for pipe subjecting the connector to high tensile and bending forces comprising a rigid metallic tubular pin having a first transverse thrust surface at one extremity, a rigid metallic tubular box telescopically disposed over said pin and having a transverse shoulder abutting said first thrust surface, said box and pin having inner and outer wall portions, respectively, spaced laterally from each other to provide an annular space therebetween, lock means on said box shiftable laterally thereof, rigid metallic thrust transmitting means in said annular space, said thrust transmitting means having a second transverse surface engaging a third transverse surface on said pin, first cam means on said thrust transmitting means engaging second cam means on said lock means, and means for shifting said lock means laterally toward said pin to force said second cam means against said first cam means to force said second transverse surface against said third transverse surface



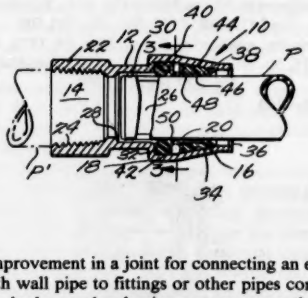
and urge said pin axially toward said shoulder to force said first transverse surface against said transverse shoulder to axially pre-load said pin and box for resisting axial separation of said first transverse surface and said shoulder under high tensile forces; and said connector having coengaged laterally opposed circumferentially extended wall means spaced from said first transverse surface and said transverse shoulder for resisting bending of the connector.

4,068,866

STAB-TYPE JOINT FOR SMOOTH END OR FLARELESS PIPE

Narayan C. Saha, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Mar. 25, 1976, Ser. No. 670,153
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—105 **18 Claims**



1. An improvement in a joint for connecting an end portion of a smooth wall pipe to fittings or other pipes comprising:

a hollow body member having a passageway therethrough with an axially extending portion for receiving the end portion of the pipe, said axially extending end portion of said passageway having a bore defining a chamber between the same and the wall of the pipe, said bore having a frusto-conical portion extending inwardly from adjacent the outer end of the end portion of said passageway, a cylindrical portion extending inwardly from the inner end of said frusto-conical portion and an annular wall at the

inner end of said cylindrical portion, said annular wall defining an inner end of said chamber and said annular wall having an inner diameter at least as great as said pipe's outside diameter whereby said pipe may pass inwardly thereof, said frustoconical portion having a minor diameter at its outer end large enough to receive the end portion of said pipe and a major diameter at its inner end from which said cylindrical portion extends;

a spring-like annular split gripper ring having an axial extent less than the axial extent of said frusto-conical portion, said ring having a frusto-conical surface tapering in the same direction as the frusto-conical portion of said bore and a cylindrical interior surface provided with pipe gripping means thereon;

an elastomeric fluid pressure activated sealing 0-ring member positioned within said chamber between said cylindrical portion and the exterior of said pipe and providing a seal between the exterior of said pipe and the interior of said passageway; and,

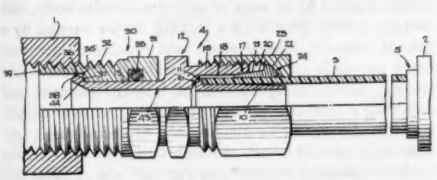
means interposed axially between said split gripper ring and said elastomeric sealing O-ring and normally flexibly urging said split gripper ring and said elastomeric sealing O-ring axially apart with said sealing O-ring engaging said annular wall whereby said gripper ring contracts into initial gripping contact with said pipe when said pipe is inserted through said gripper ring an initially and then continuously applying an axial load on said sealing O-ring sufficient to cause radial sealing before and after being fluid pressure actuated, said last mentioned means being a resilient ring having a wall thickness substantially less than the radial spacing between said cylindrical portion of said bore and the exterior surface of said pipe.

4,068,867

AIR HOSE FITTING

Frank J. Rodgers, Fanwood, and Harold Gibson, Califon, both of N.J., assignors to Nycoil Company, Fanwood, N.J.

Filed Mar. 15, 1976, Ser. No. 666,901
Int. Cl.[2] F16L *27/08*
U.S. Cl. 285—174 **2 Claims**



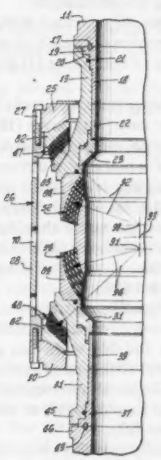
1. A swivel fitting comprising a hollow outer member and a hollow inner member, each of said members having an axis, the inner member having a portion extending from one end and mounted within the outer member in axial alignment therewith, said extending portion having a cylindrical wall, the outer and inner surfaces of said wall being parallel to each other and to the axes of both inner and outer members, locking element means at the end of said extending portion and cooperating with said outer member to hold the two members together, said outer member being countersunk to provide an internal shoulder, said locking element means on said inner member comprising an outwardly extending lip cooperating with and in contact with said shoulder to hold the two elements together, the inner surface of said lip being outwardly flared and at an angle to the inner surface of said extending portion, a notch in the outer surface of said extending portion connecting said lip and said outer surface of said extending portion, the cross sectional shape of said notch comprising front and rear substantially straight-walled edges angled with respect to each other and meeting each other radially inwardly from said outer surface, the front edge thereof being the portion of said lip which cooperates with and is in contact with said shoulder to hold the two elements together, a seal between said inner and outer members and in direct contact with both, said outer member being provided with a circular channel to accommodate said seal, the inner surface of the outer member and the outer surface of the inwardly extending portion of the inner member between said locking elements and said seal being elongated parallel to each other and in substantial contact with each other to prevent the two from wobbling relative to each other, said inner member having a hose clamping mechanism extending from the other end which comprises an inwardly tapered inner supporting element and an outer ferrule adapted to hold a hose therebetween, said inner supporting element having an outwardly extending stop shoulder, said inner member having a stop shoulder and the inner supporting member having a front stop on said outwardly extending stop shoulder against which the stop shoulder of said inner member abuts, said ferrule having an outer beveled surface and a rear heel, the inner member having a beveled bearing surface adapted to bear against the beveled surface of the ferrule and a locking nut mounted over the outer member and having a portion adapted to bear against the heel of the ferrule.

4,068,868

FLEXIBLE JOINTS FOR MARINE RISERS

Juergen H. Ohrt, Kreis, Rensdburg, Germany, assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Sept. 2, 1975, Ser. No. 609,584
Int. Cl.[2] F16L *27/04*
U.S. Cl. 285—263 **19 Claims**



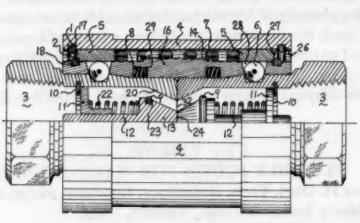
1. A flexible joint through which fluid can be conducted comprising: first and second bodies having a fluid passage therethrough and adapted to be disposed in a tubular string, a housing structure surrounding said bodies, a first bearing assembly between and engaging said first body and housing structure for transmitting loads therebetween while permitting relative tilting between said first body and housing structure, a second bearing assembly between and engaging said second body and housing structure for transmitting loads therebetween while permitting relative tilting between said second body and housing structure, and a seal assembly between and engaging said bodies to prevent fluid flow between said passage and the exterior of said bodies, said seal assembly including means for transmitting axial loads between said bodies while permitting relative tilting between said bodies, each of said bearing assemblies including laminations of alternate layers of rigid material and yieldable material and secured to a body and housing structure, said seal assembly including a third body between said first and second bodies and laminations of alternate layers of rigid material and yieldable material

between and secured to said third body and each of said first and second bodies, said housing structure including means for compressing said first and second bearing assemblies between said housing structure and first and second bodies and said seal assembly laminations between said third body and said first and second bodies.

4,068,869
COUPLER

Tadaaki Maruyama, 1089-130 Nedo Abiko, Chiba, Japan

Filed June 16, 1976, Ser. No. 696,770
Claims priority, application Japan, June 16, 1975, 50-71988
Int. Cl.² F16L *37/18*
U.S. Cl. 285—316 **1 Claim**



1. A coupler for connecting a pair of plugs (3) in fluid tight relationship comprising in combination:

an outer sliding sleeve (4) provided with a pair of internal annular narrow grooves (17) each of which is formed on the internal surface of said sleeve (4) adjacent to each end thereof,

an inner stationary sleeve forming a socket (16) having a pair of external annular narrow grooves (18) each of which is formed on the external surface of said socket (16) adjacent to each end thereof, a plurality of circumferentially spaced detent means-receiving holes (28) which are disposed axially inwardly adjacent to said external narrow grooves (18), a pair of external radial shoulders (14) axially inwardly spaced from said holes (28) for limiting the inward movement of a pair of axially sliding collars (5) with respect to said socket (16),

a pair of axially sliding collars (5), each of which is provided with a frustoconical cam surface (27) at its one end, mounted coaxially slidably within an annular space (26) defined between said sliding sleeve (4) and said stationary socket (16), and disposed symmetrically to each other with respect to said shoulders (14) so as to face the outside at said cam surfaces (27),

detent means (6) radially movably received in said holes (28) to connect said plug (3) positively with said socket (16) when said collar (5) is positioned over said detent means thereby preventing said detent means (6) from moving radially outwardly after said plug (3) is fully inserted into said socket (16) and to disconnect said plug (3) from said socket (16) when said collar (5) is axially inwardly moved toward its innermost position adjacent to said shoulder (14) thereby being positioned away from said detent means for releasing said detent means (6) from their locking position,

a pair of relatively large diameter snap rings (1) mounted in said internal narrow grooves (17) for providing internal radial projections which serve as means for driving said collars (5) to right and left along the periphery of said socket (16),

a pair of relatively small diameter snap rings (2) mounted in said external narrow grooves (18) for providing external radial projections which serve as means for limiting the outward movement of said collars (5) with respect to said socket (16),

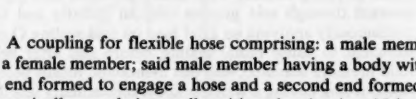
bias means (7) for biasing said collars (5) outwardly so as to make said collars (5) abut resiliently against said snap rings (1 and 2) at said cam surfaces (27),

sealing means (8) fixedly mounted in said socket (16) inwardly beyond said holes (28) for establishing sealing engagement between said socket (16) and plugs (3).

4,068,870
FLEXIBLE HOSE COUPLING

John Kimball Whitney, Orchard Park; Allan Hugh Cosgrove, Eggertsville, and Roland Edward Flick, West Seneca, all of N.Y., assignors to Gaymar Industries Incorporated, Orchard Park, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,275
Int. Cl.² F16L *47/00*
U.S. Cl. 285—320 **4 Claims**



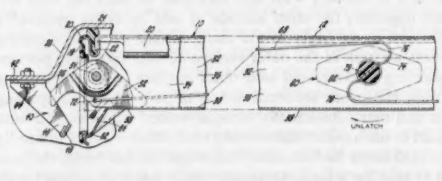
1. A coupling for flexible hose comprising: a male member and a female member; said male member having a body with a first end formed to engage a hose and a second end formed to telescopically couple internally with a chamber in said female member; said female member having a body with a first end formed to engage a hose and a second end containing said chamber formed to receive said second end of said male member therein, said chamber having a circular cross-section; the outer configuration of said second end of said female member being non-circular; and

releasable locking means formed on said male member to engage a specific area on said female member, said specific area lying between said first and second ends of said female member and being immediately adjacent a locking surface formed by an edge of said non-circular body, said locking means comprising a locking device carried by a pair of opposed, hinged arms, said locking device thus being pivotable into and out of locking engagement said locking device being formed of resilient material and including a semi-circular unit comprising an over-center-semi-circular aperature dimensioned to encompass a specific area of said other member adjacent said locking surface, said semi-circular unit and said non-circular second end of the female member being constructed to prevent closing said semi-circular unit over said non-circular second end in the event the male member is not sufficiently seated within said chamber.

4,068,871
LATCH OPERATING MECHANISM

Robert R. Mercer, Ortonville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1976, Ser. No. 738,603
Int. Cl.² E05C *9/00*
U.S. Cl. 292—48 **3 Claims**



1. A latch mechanism acting between a first member and a

second member movable relative the first member, said latch mechanism comprising:

first and second latch bolts movably mounted on one of the members for movement between a latched position engaging the other member and an unlatched position permitting movement of the second member relative the first member;

a continuous flexible rod having one end connected with one latch bolt and a second end connected with the other latch bolt, said flexible rod providing the sole operating connection between the first and second latch bolts and resiliently urging the first and second latch bolts to their respective latched positions

and a handle journalled for rotation on the member to which the first and second latch bolts are movably mounted, said handle being operatively connected with the flexible rod so that rotation of the handle flexes the flexible rod to move the first and second latch bolts from the latched position to the unlatched position.

4,068,872

LATCHED CABINET STRUCTURE

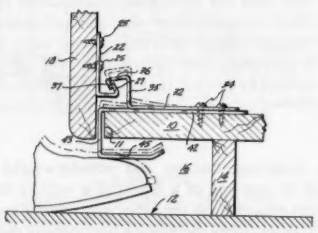
Charles V. Smith, 24120 Dunlap Road, Bothell, Wash. 98011

Filed Feb. 11, 1976, Ser. No. 657,159

The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.

Int. Cl.[2] E05C *19/06*

U.S. Cl. 292—87 **2 Claims**



1. In a cabinet or the like having a kick space beneath the front edge of the bottom shelf and a door panel hinged at one side edge to said cabinet and normally closing to said bottom shelf, substantially invisible latching mechanism for said door, comprising: an instanding strike device on the inside of said door panel, said strike device having an upstanding catch located to overlie the bottom shelf in spaced relation thereabove when the door is closed; an elongated latching tang is secured to the upper face of said shelf and disposed wholly inside the front edge of said shelf and, said tang including a downwardly-biased, forward-extending flexible arm supporting a downstanding jaw latch located to engage said catch to retain said door closed against said shelf edge, and unlatching means, comprising:

an upwardly movable, flexible lifter arm secured to said shelf in underlying relation to said flexible arm and operable upward in the space beneath said strike device to disengage said jaw latch from said catch;

said lifter arm extending forwardly past the front edge of said shelf; and

a lifter leg depending from the forward portion of said lifter arm between said shelf front edge and the door closed thereto, said leg having a lower terminal in spaced relation to the underside of said shelf and accessible to be engaged by a user's toe applied with an upward thrust.

4,068,873

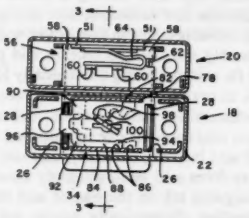
AUTOMATICALLY CLOSING LOCK

Carmen Testa, Stamford, and William J. Bouton, Jr., South Norwalk, both of Conn., assignors to Excelsior Hardware Co., Stamford, Conn.

Filed May 21, 1976, Ser. No. 688,773

Int. Cl.[2] E05B *65/48;* E05C *19/10*

U.S. Cl. 292—101 **7 Claims**



1. An automatically closing lock for a container having a body and a closure mounted with the body for movement to close it, said lock comprising:

A. a catch assembly having a catch housing adapted to be mounted on one of said container closure and body, said catch housing defining

1. a planar striker surface formed with at least one catch slot therein; and

2. a catch surfact defined by said catch slot having a portion substantially perpendicular to said striker surface;

B. a latch assembly having;

1. a latch housing, formed with an attachment slot, adapted to be mounted on the other of said container closure and body;

2. a latch member pivotably mounted with said latch housing and having

a. a web formed to overlie said striker surface,

b. at least one tab formed with said web to interfit with said catch slot, said tab having

1. an inclined edge formed to slidingly engage said catch housing and pivot said latch member away therefrom and to align said tab with said catch slot,

2. a hook-like surface shaped to latchingly engage said catch surface when said tab is interfitted with said catch slot; and

c. means for limiting pivoted movement of said latch member in said latch housing to less than 90°, said limiting means comprising:

1. a hanger bar formed with said latch member to project into said attachment slot, and

2. retainer means for preventing disengagement of said hanger bar from said attachment slot and against which said hanger bar binds to limit latch member pivoted movement, and

C. means for urging said latch member to pivot into firm contact with said striker surface and said tab into interfitting engagement with said catch slot.

4,068,874

ROTARY LATCH MECHANISM WITH LOCKING DEVICE

Paul D. Fleming, and Kenneth N. Gullekson, both of Glendale, Calif., assignors to W & F Manufacturing Inc., Glendale, Calif.

Filed Mar. 1, 1976, Ser. No. 662,623

Int. Cl.[2] E05C *3/04, 19/10*

U.S. Cl. 292—128 **7 Claims**

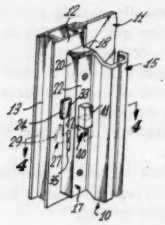
1. In a combined handle, latch and locking assembly including an elongated handle, a mounting channel joined to said handle for attachment to a sliding closure, a latch assembly including a rotary latch member secured to an axle stud and

supported by said stud for movement between latched and unlatched positions, and means mounted said latch assembly in said mounting channel beneath a top wall thereof, for extension and retraction of said latch member therefrom, an improved locking device comprising:

a locking slide comprising a generally rectangular, thin and flat base plate, and a box-like projection on one side of said base plate forming an operating knob for the locking device, said slide having a recess opening through the other side and extending into said projection;

means defining a slot in said cover wall overlying said latch assembly and sized to receive said projection with a sliding fit, said slot being substantially longer than the projection to permit the latch to reciprocate in said slot along a predetermined path between locked and unlocked positions, said base plate being disposed between said top wall and said latching assembly, and said projection extending away from said latch assembly through said slot;

an elongated tab on the end of said stud adjacent said slide extending diametrically across the stud and projecting



into said recess, said tab having flat sides spaced a preselected distance apart and being centered on the axis of said stud;

means in said recess defining an elongated channel parallel to said path and having sidewalls spaced and positioned to receive said tab with a close fit when the latter is parallel to said path, thereby to prevent rotation of said tab, said stud and said latch member, said tab being positioned on said stud to be parallel to said path when said latch member is in the latched position;

said recess also having an enlarged clearance portion at one end of said channel, large enough to permit said stud to rotate unobstructed therein;

said tab being disposed in said clearance portion when said slide is in said unlocked position, and in said channel when said slide is in said locked position;

and detent ridges on the sidewalls of said channel at the juncture of said clearance portion and said channel for yieldably resisting passage of said tab, thereby to hold the slide releasably in the locked and unlocked positions.

4,068,875

SECURITY LATCH FOR SLIDING DOORS

Nathaniel W. Miller, Hopewell, Va., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Sept. 29, 1976, Ser. No. 727,946

Int. Cl.[2] E05C *1/04*

U.S. Cl. 292—206 **1 Claim**

1. A latch for sliding doors, comprising:

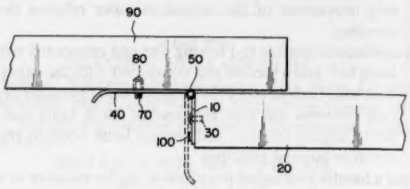
a first flat steel plate;

a second flat steel plate having one upwardly curving end;

a hinge connecting the two plates end to end so that the plates can be folded together parallel to each other or apart perpendicular to each other, with the curved end of the second plate being remote from the hinge and curving towards the first plate when the plates are folded together;

a threaded screw threaded through a threaded hole in the second plate, with the head of the screw projecting out of that side of the second plate which will be adjacent the first plate when the plates are folded together;

a magnet located on that side of the first plate which is



adjacent the second plate when the plates are folded together; and

a torsion spring located at the hinge and pressing the plates apart.

4,068,876

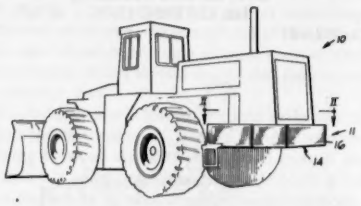
BUMPER AND COUNTERWEIGHT ARRANGEMENT AND METHOD FOR ASSEMBLING THE SAME

Donald R. Muellner, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 674,786

Int. Cl.[2] B60R *19/04*

U.S. Cl. 293—69 R **20 Claims**



1. A combined bumper and counterweight arrangement mounted on one end of a frame of a vehicle having a work implement mounted on the other end thereof comprising

a bumper assembly including a horizontally disposed bottom plate and a plurality of upstanding plates secured to said bottom plate to define a compartment therein,

a counterweight disposed within said compartment and resting on said bottom plate,

bracket means comprising at least one horizontally disposed bracket mounting said bumper assembly on said frame

a vertically disposed pin further disposed in vertically aligned bores formed through said bracket and said frame whereby said bumper assembly can be mounted expeditiously on said frame and

vertically disposed attachment means releasably attaching said counterweight to said bottom plate.

4,068,877

ROLLER VEHICLE PUSHING BUMPER

Finn Burleson, Lubbock, Tex., assignor to Winston P. Brummette and Craig Brummette, both of Lubbock, Tex., part interest to each

Filed Aug. 2, 1976, Ser. No. 710,472

Int. Cl.[2] B60R *19/00, 21/14;* B61F *19/04*

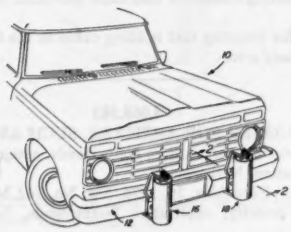
U.S. Cl. 293—72 **1 Claim**

1. In combination with a motor vehicle including, arranged transversely of a longitudinal extent of the vehicle, a longitudinally extending front bumper substantially disposed in a vertical plane, a pair of vehicle pushing bumpers spaced along the bumper symmetrically with respect to a midpoint of the longi-

tudinal extent of the bumper, each of the pushing bumpers comprising, in combination:

a. a roller; and

b. bracket means connected to the roller for rotatably mounting the roller in substantially vertical disposition on the bumper of the vehicle, the bracket means including a framework attachable to the front bumper of the vehicle, a vertically disposed axle rotatably journaled on the freamwork, with the roller being rotatably journaled on the axle, the roller having a substantially cylindrical configuration including a cylindrical surface revolving about an axial extent of the roller, and the roller being provided with an axial through hole arranged for receiving the axle,



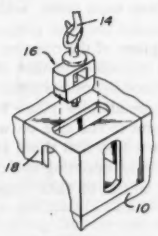
with the cylindrical surface of the roller being entirely spaced horizontally from the vertical plane of the bumper, the framework including a substantially planar first part journaling the axle and extending from the axle and beneath the front bumper, and a second part having a portion shaped to conform to the front bumper and a portion arranged substantially parallel to the first part and disposed journaling the axle in cooperation with the first part, the roller being constructed from a resilient material, with the roller being provided with a plurality of bores in radial distribution about the roller and extending substantially parallel to the axial through hole provided in the roller.

4,068,878

CONTAINER LIFT COUPLING

Irving Wilner, Cranford, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 28, 1976, Ser. No. 727,504
Int. Cl.² B66C 1/66
U.S. Cl. 294—83 R **10 Claims**



1. A twist lock coupling for a hollow lift fitting having a slot therethrough, comprising, in combination:

a shank member for inserting in the slot and having an elongated shank portion adapted to be connected at one end to a lifting device and having at the other end a pair of opposed segments laterally extending in opposite directions from said shank portion formed to closely fit through the slot when parallelly aligned therewith and to engage the inside of the lift fitting on either side of the slot when orthogonally aligned therewith; and

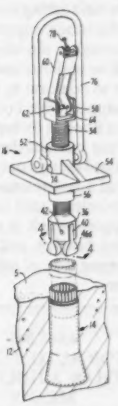
a locking member rotatably and slidably disposed on said shank portion intermediate the ends and laterally extending in opposite directions from said shank portion and formed to fit in the slot when parallelly aligned therewith, said locking member having a recess formed therein for non-rotatable gravitational engagement with said segments and the fitting when said shank member is inserted in the slot with said segments orthogonally aligned below the slot, thereby locking said shank member in the lift fitting.

4,068,879

CONCRETE SLAB HOISTING APPARATUS

Philip A. Torbet, San Mateo, and Cyril Thomas Eager, San Francisco, both of Calif., assignors to The Burke Company, San Mateo, Calif.

Filed July 12, 1976, Ser. No. 704,368
Int. Cl.² B66C 1/66
U.S. Cl. 294—89 **10 Claims**



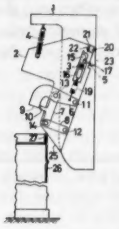
1. Apparatus for engaging a concrete slab to hoist the same, said slab having a generally planar surface, said apparatus comprising in combination: a socket cavity in said slab, said cavity being elongated along an axis substantially normal to said surface and symmetrical about said axis, said cavity having a cylindric portion communicating with said surface and a frusto-conical portion below said surface accessible through said cylindric portion and coaxial therewith, said frusto-conical portion defining a wall that converges in a direction toward said surface; a shaft having a diameter less than said cylindric portion and a length greater than the depth of said cavity, said shaft having an inner end and an outer end, a cylindrical enlargement on said inner end defining a bearing surface of substantially the same diameter as said cylindric portion and being coaxial with said shaft; at least three arms secured to said inner end at equal angularly spaced positions therearound for pivotal movement between a retracted position to afford insertion and removal of said shaft relative said cavity and an extended position for engaging said frusto-conical wall; and means accessible from the outer end of said shaft for controllably moving said arms between a retracted position and an extended position.

4,068,880

AUTOMATIC DRUM GRIPPER

Takefusa Kikuchi, 3-6-18, Sakai, Musashino, Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,689
Claims priority, application Japan, Feb. 28, 1976, 51-15827
Int. Cl.[2] B66C *1/42*
U.S. Cl. 294—90 **2 Claims**



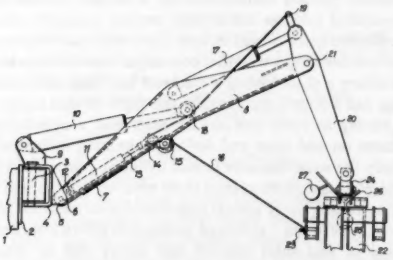
1. An apparatus to hold and transport a drum by gripping and releasing its chime automatically, consisting of a lifting bracket, which is to be installed on a fork lift or other lifting device, of a gripper bracket, equipped with a chime gripping device, consisting of said gripper bracket, of a pair of gripping levers, each of which, having a gripper jaw to grip the chime of a drum and of a connecting lever, these four members being pin jointed with each other to make a quadrilateral link mechanism and suspended by said lifting bracket through a spring at one side and also at the other, supported vertically freely by said lifting bracket through a pin-elliptical hole joint, so as to swing and to be able to shift to and hold the most suitable position automatically to conform to various conditions during the operation, and equipped with a releasing device, consisting of a jaw releaser with a hook at its top end and vertically freely supported by said lifting bracket through a pin-elliptical hole joint and at its bottom end being connected with said quadrilateral link by a spring, of a jaw releaser stopper, equipped with a disengaging slider to release said jaw releaser off a stop jaw of a jaw releaser stopper, which is equipped at the top right corner of said gripper bracket and of a disengaging slider pusher, fixed at the upper side of said lifting bracket, to push said disengaging slider.

4,068,881

ARRANGEMENT FOR AUTOMATIC REGULATION OF THE CABLE LENGTH OF A HOLDING CABLE OF GRAB MEANS

Mirko Dressler, and Ladislav Dofek, both of Krtiny, Czechoslovakia, assignors to Vyzkumny ustav lesniho hospodarstvi a myslivosti, Jiloviste-Strnady, Czechoslovakia

Filed Oct. 13, 1976, Ser. No. 732,122
Int. Cl.[2] B66C *1/42*
U.S. Cl. 294—111 **3 Claims**



1. An arrangement for the automatic regulation of the cable length of a securing cable of grab means suspended on one end of an auxiliary arm supported in rocking fashion on one end of an elongated jib arm, which jib arm is anchored on some traction means and adapted to be raised and lowered, said arrangement comprising in combination:

a holding cable, one end of said cable being coupled to the grab means, the other end of said cable being fastened to the other end of the auxiliary arm remote from the end of said auxiliary arm on which said grab means is suspended;

first guiding means for said cable provided on the grab means;

second guiding means for said cable disposed on said jib arm;

a tensioning roller with tensioning means for tensioning said cable disposed on said jib arm;

said holding cable overlying a portion of said tensioning roller;

third guiding means for said cable provided on said jib arm; and

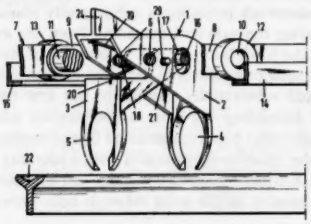
means for securing said holding cable to the free end of the auxiliary arm.

4,068,882

CARRIER FOR ARTICLES, SUCH AS EGGS

Jelle van der Schoot, Aalten, Netherlands, assignor to Staalkat B.V., Aalten, Netherlands

Filed Nov. 16, 1976, Ser. No. 742,248
Claims priority, application Netherlands, Nov. 21, 1975, 7513631
Int. Cl.[2] B66C *1/42*
U.S. Cl. 294—116 **9 Claims**



1. A carrier for articles, such as eggs, comprising:

a. a frame;

b. two hook-shaped gripper means, each of which has a free end which has an opening, for receiving between said free ends an article having its longitudinal axis oriented substantially horizontally;

c. shafts, mounted in said frame, for pivotally mounting the other ends, opposite said free ends, of said hookshaped gripper means, so that the free gripper ends can be moved towards and from each other, which shafts at minimum interspace between the free gripper ends always lie inwardly of the plane of the opening of the free end of the gripper means mounted on that shaft and wherein said shaft for each hook-spaced gripper means lies on a side of the median perpendicular plane between the free ends which is opposite to the side on which the free end lies which is supported by that shaft; and

d. means for pivotally mounting said other ends of the hookshaped gripper means on their respective shafts.

4,068,883

WIND DEFLECTOR CONFIGURATION

Steven L. Meinecke, Woodbridge, Va., and Walter Selden Saunders, Baltimore, Md., assignors to Walter Selden Saunders, Baltimore, Md.

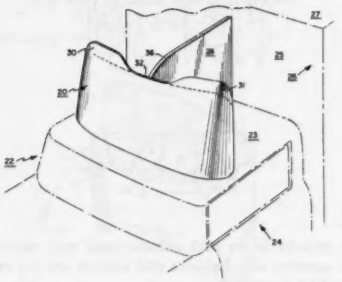
Filed June 11, 1975, Ser. No. 585,843
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—1 S **15 Claims**

1. A wind deflector for mounting to land vehicles forward of a drag producing surface and comprising upstanding baffle

means positioned above a substantially horizontal surface for deflecting oncoming air over the drag producing surface and thereby reducing the drag caused by said surface and comprising:

A. a substantially rectangular frontal shape generally convex in a horizontal plane as viewed from the front and generally angled in the vertical plane toward the rear; and

B. at least one extension portion



a. positioned about an upper corner of said substantially rectangular baffle means, and

b. increasing the height dimension of the baffle means at said corner, and

c. said extension substantially smoothly continuing said convex and rear angled contour of said frontal shape,

thereby providing a wind deflector with improved drag reduction capabilities.

4,068,884

UNDERSTRUCTURE OF AN AUTOMOTIVE BODY

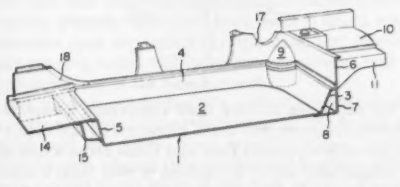
Hiroo Watanabe, Tokyo, and Yoshiaki Ocho, Wakoo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,209

Claims priority, application Japan, Sept. 11, 1975, 50-124379; Sept. 11, 1975, 50-124380

Int. Cl.² B62D *23/00*

U.S. Cl. 296—28 F **3 Claims**



1. An understructure for an automotive body comprising:

a dished floor panel having a single continuous flat body portion and four side portions rising from the periphery thereof;

an angled dashboard panel defined by an upstanding body portion integrally secured to the outer surface of a front side portion of said floor panel along a top edge thereof, and a horizontally rearwardly extending bottom portion integrally secured along the rear side edge thereof to said front side portion of said floor panel at said bottom thereof, both said body portion and said bottom portion transversely extending from side to side of said automotive body so as to define, in cooperation with said front side portion of said floor panel, a first hollow reinforcing beam of substantially triangular cross-section extending transversely and continuously from side to side of said automotive body;

a pair of trough-like side frames opening sidewise toward each other and integrally secured along the upper and lower edges thereof, to the outer surfaces of the adjacent lateral side portions of said floor panel to define a pair of second longitudinally extending hollow reinforcing beams, said second reinforcing beams being integrally and continuously connected at their front ends with said first reinforcing beam at its lateral sides forming a continuous hollow space.

4,068,885

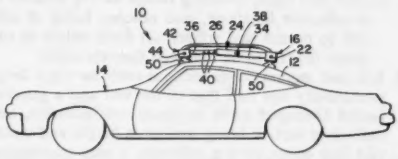
RETRACTABLE HEAT SHIELD FOR VEHICLES

Leon H. Berger, 38 Indiana Ave., Long Beach, N.Y. 11561

Filed Jan. 5, 1977, Ser. No. 756,900

Int. Cl.² B60N *3/06*

U.S. Cl. 296—78 R **5 Claims**



1. A retractable heat shield for the roof of a vehicle comprising in combination:

a first pair of end housings and a first rod element connected therebetween so as to maintain said end housings in spaced relation;

a flexible shade element mounted rollably on said first rod element;

first and second pairs of elongated telescopable members, one end of each of said pairs of telescopable members being connected to respective ones of said end housings, said pairs of telescopable members being adapted to extend in spaced generally parallel relation;

a second pair of end housings connected respectively to the other ends of said pairs of telescopable members;

a transverse support rod connected between said second pair of end housings in generally parallel relation to said first rod element;

means carried by said shade element adjacent the free edge thereof adapted to detachably mount same on said transverse support rod; and

means on each of said end housings for removably mounting the same on the roof of a vehicle, whereby said shade element may be selectively extended in spaced overlying relation to the roof of a vehicle.

4,068,886

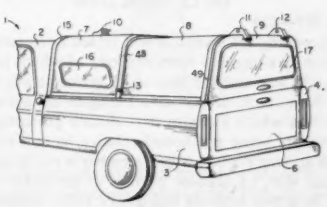
TELESCOPIC COVER ASSEMBLY FOR OPEN BED VEHICLES

Richard B. Gostomski, 636 Sixth St., Owen, Wis. 54460

Filed Oct. 28, 1976, Ser. No. 736,647

Int. Cl.² B60J *7/10*

U.S. Cl. 296—137 B **8 Claims**



1. Apparatus for covering in a substantially weathertight sealing configuration the open bed of a vehicle, the bed having

first and second ends and opposing sides, said apparatus comprising:

a. first and second track members adapted to be mounted on the opposite sides of the bed in a parallel relationship to each other, each of said first and second track members including:

1. a first elongate runner section extending substantially from the first end of the bed to the second end thereof;
2. a second elongate runner section in juxtaposition with said first runner section, said second runner section extending substantially from the first end of the bed to a location past the midpoint between the first and second ends of the bed;
3. said first and second runner sections each having a longitudinal roller slot and roller retaining flange extending the length thereof;
4. each said roller retaining flange having notches therein in selective locations, said notches being of sufficient size to permit said rollers, set forth below in subparagraph (c) (1), to be removed therethrough;

b. first and second cover sections each having a length approximately one half that of the bed and a generally inverted U-shaped cross sectional configuration, said second cover section being smaller in height and width than said first cover section whereby it may telescopingly fit within said first cover section;

c. said first cover section further including roller means affixed on each side thereof and rollably engaged with said slot and roller retaining flange of said second runner sections, said roller means including;

1. a first pair of rollers on one end of said first cover section, one on each side thereof, and a second pair of rollers on the other end of said first cover section, one on each side;
2. each roller having an axle extending therethrough, said axle affixed to said second cover section in a substantially horizontal cantilevered fashion;

d. said second cover section further including roller means affixed on each side thereof and rollably engaged with said slot and roller retaining flange of said first runner sections, said roller means having a configuration exactly like that described above in subparagraphs (c) (1) and (c) (2); and

e. said notches in said roller retaining flanges being located along said track members in such a relationship to each other that said second pairs of rollers may be selectively aligned therewith to either individually or simultaneously remove or pivot said first and second cover sections through an arc of from 0° to about 90° with respect to the plane of said track members while said first pairs of rollers remain engaged with said slots and roller retaining flanges.

4,068,887

SEAT MOUNTINGS

Frederick William Babbs, Sherwood, England, assignor to Cox of Watford Limited, England

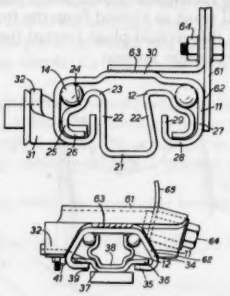
Filed Aug. 19, 1975, Ser. No. 605,936

Claims priority, application United Kingdom, Aug. 22, 1974, 37013/74

Int. Cl.[2] B60R *21/10*

U.S. Cl. 297—216 **14 Claims**

1. A mounting for a vehicle seat which comprises two relatively slidable elongated members, one of which is attachable to a vehicle seat and the second of which is attachable to a vehicle floor, each of said two elongate members having a cross-section which includes two arcuate portions, said elongate members being positioned relative to one another such that each arcuate portion of one member is positioned in correspondence with an arcuate portion of the other member to thereby form two separate ball tracks; roller means positioned in each of said ball tracks to provide frictionless slidable movement between said elongate members; each elongate member also including extension flanges extending beyond each of said arcuate portions, said extension flanges of each of said two elongate members cooperating with each other to contact and bend one another in response to loads applied to said elongate



member attachable to said vehicle seat; and means on said elongate member attachable to said vehicle seat for connection to one end of a seat belt.

4,068,888

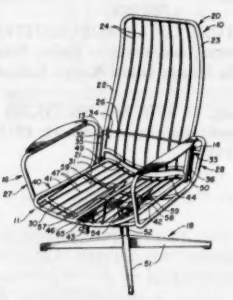
RECLINER CHAIR

Merton M. Bottemiller, Wadena, Minn., assignor to Homecrest Industries, Inc., Wadena, Minn.

Filed Jan. 7, 1976, Ser. No. 647,134

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—317 **7 Claims**



1. An adjustable recliner chair comprising a base, a chair supporting frame secured to and supported by said base, a chair back pivotally supported from said frame about a first pivotal axis substantially above the bottom of said back, a chair seat pivotally secured to the rear thereof to said chair back along a second pivotal axis substantially below said first pivotal axis, and a cam member secured to the underside of said seat adjacent the front thereof with an inclined lower wall in the form of a plate sloping downwardly from front to rear and having a slot of predetermined length therethrough extending longitudinally of said plate, said supporting frame having a support member extending beneath said inclined lower wall of said cam member in adjustable engagement therewith so that as said chair back is tilted back, the chair seat moves forwardly and the front portion thereof moves upwardly due to shifting of the area of engagement of the inclined wall of said cam member with said support member, a friction member engaging said plate, said support member having a rod member extending through said slot and through said friction member generally transverse to said plate, the amount of movement of said chair seat relative to said supporting frame being limited by the engagement of said rod member with the opposite ends of said slot, and said rod member having means associated therewith

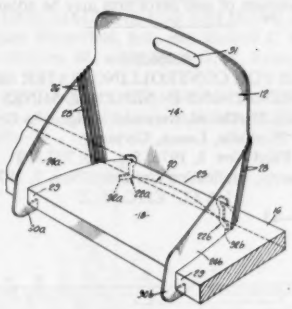
for holding said friction member in yieldable frictional engagement with said plate.

4,068,889

PORTABLE BACK REST

James E. Pierce, and Max E. Goodwin, both of Valencia, Calif., assignors to Marcy Gymnasium Equipment Co., Glendale, Calif.

Filed Apr. 19, 1976, Ser. No. 677,927
Int. Cl.[2] A47C *1/16*
U.S. Cl. 297—352 2 Claims



1. A one-piece foldable back rest adapted to be releasably locked on a bleacher seat, comprising:

a. a back panel formed of a resilient flexible polyethylene sheet material, said back panel being substantially planar in its transport configuration and capable of being flexed into an operative back supporting configuration;

b. first bleacher seat gripping means for releasably gripping the rearward edge and bottom surface portions of the bleacher seat when said back panel is in its operative configuration, said first gripping means comprising at least two hook-shaped members formed integrally with said back panel, depending downwardly therefrom and disposed in the plane of said back panel when the latter is in a transport configuration said hook-shaped members including outwardly extending fingers and being movable with said back panel and substantially immovable relative thereto, whereby when said back panel is flexed into an operative back supporting configuration, said fingers of said gripping means will move into engagement with the bottom surface of the bleacher seat;

c. a pair of side panels formed of a resilient flexible polyethylene sheet material hingeably interconnected to said back panel, said side panels being movable from a transport configuration wherein they are disposed in planes substantially parallel to the plane of said back panel to an operative configuration wherein they are disposed in planes forming an angle relative to said back panel, said side panels being swingably movable relative to said back panel about hinge means formed intermediate each of said side panels and said back panel, said hinge means comprising a plurality of stria formed in said flexible material intermediate said back panel and each of said side panels; and

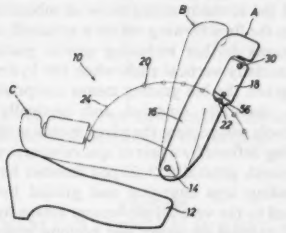
d. second bleacher seat gripping means integrally formed on each of said side panels for releasably gripping the forward edge portions of the bleacher seat when said side panels are in an operative configuration, said second bleacher seat gripping means comprising hook-shaped members formed at the free ends of said side panels and so constructed and arranged to embrace the front edge and undersurface of the bleacher seat, said members being movable with said side panels and substantially immovable relative thereto.

4,068,890

SEAT LOCK DEVICE

Toshio Kurozu, Chigasaki; Shinjiro Yamada, Tokyo, and Norio Miyashita, Oizumi, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd. and Honda Motor Co., Ltd., both of Tokyo, Japan

Filed Apr. 29, 1977, Ser. No. 792,239
Claims priority, application Japan, May 19, 1976, 51-56655
Int. Cl.[2] A47C *1/024*
U.S. Cl. 297—355 5 Claims



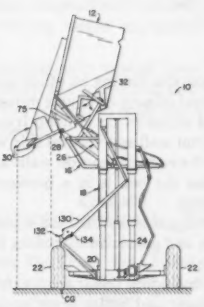
1. A seat lock device comprising a lock unit fitted to one member of an immovable member and a swingable back rest member of a seat, the back rest member being rotatably supported by a pivotal shaft mounted on the immovable member and at a point spaced from the pivotal shaft; a plurality of strikers mounted on the other member of the immovable member and the swingable member along the circumference of a circle centered at the pivotal shaft for lockable engagement with the lock unit, wherein the lock unit includes a case; a substantially circular actuating unit pivotally supported by the case to be rotated into selective engagement with any of the strikers; lock means for locking the actuating unit when it is rotated to a lock position; a direction-setting unit for rotating the actuating unit to set it at a free position ready for engagement with an approaching striker while the actuating unit remains disengaged from all said strikers; a gate means for preventing the lock action of the lock means while the actuating unit remains disengaged from all the strikers; and a releasing mechanism for releasing the lock action of the lock means.

4,068,891

SIDE DUMP TRAILER WITH RETRACTABLE CHUTE

Benjamin T. Herbst, P.O. Box 67, Esparto, Calif. 95627

Filed Oct. 18, 1976, Ser. No. 733,622
Int. Cl.[2] B62B *1/00*
U.S. Cl. 298—7 9 Claims



1. A stable dump cart capable of operating in a low overhead environment for the discharge of materials from the cart into a container having a relatively high side, the cart comprising: a support frame including a plurality of laterally spaced-apart members supporting the frame on the ground, the support

members comprising a plurality of spaced-apart wheels defining between them a lateral wheel base; a bin carried by the frame for receiving materials that are to be dumped into the container; means attached to the frame and the bin for moving the bin in a vertical direction between a lowermost material receiving position attached to the frame and an uppermost position, from which the materials are discharged into the container, the vertical movement means comprising a pair of spaced-apart hydraulic actuator means and including means for flowing hydraulic fluid under pressure to the actuator means; means for adjusting the rate of flow to the actuator means so that the actuator means move at substantially identical rates when the fluid flowing means is actuated; said vertical movement means further including means guiding the bin along a substantially vertical path when the hydraulic actuators are energized, the bin guiding means comprising a pair of spaced-apart, vertically oriented and vertically extensible masts operatively connecting the pivot means with the frame; each mast being defined by a pair of spaced-apart vertical posts and an uppermost, generally U-shaped member having downwardly extending legs engaging and guided by the posts; means attached to the vertical movement means for tilting the bin from the material receiving and holding position into an inclined material dumping position, the tilting means being disposed within the lateral extent of the support members to thereby avoid any instability of the cart during the dumping operations; and means for guiding materials being dumped from the bin laterally past the support members into the container positioned adjacent the cart and laterally spaced from the support members.

4,068,892

TAIL GATE APPARATUS HAVING AN OFFSET PIVOT AXIS

Rafael J. Welch, P.O. Box 175, St. John, Kans. 67576

Filed Dec. 20, 1976, Ser. No. 752,472
Int. Cl.[2] B60P *1/04*
U.S. Cl. 298—17 R **5 Claims**

3. A tail gate apparatus having an offset pivot axis for automatically opening and closing a tail gate mounted at the rear of a tiltable truck bed mounted on a dump truck, the truck bed having a vertical front wall and vertical side walls, the tail gate disposed adjacent the ends of the side walls and the bottom of the truck bed when the bed is in a horizontal position, the apparatus comprising:

a pair of elongated gate arms attached at one end to the sides of the tail gate, said gate arms extending forwardly toward the front wall;

a pair of collars including collar arms extending outwardly from said collars, said collar arms having a plurality of apertures therein for adjustably attaching to the other end of said elongated gate arms;

a pair of mounting brackets mounted on top of the side walls, said mounting brackets positioned at a predetermined distance from the rear of the truck bed; and

an elongated pivot arm mounted horizontally and parallel to the width of the truck bed, said pivot arm slidably received through said collars, the ends of said pivot arm attached to said mounting brackets;

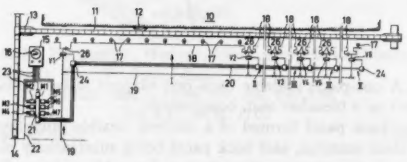
the tail gate, said gate arms and said collars pivoting about a horizontal axis through the center of said pivot arm, the horizontal axis offset and forward the rear of the truck bed so that the tail gate will open and close automatically based on the angle of the unloading position of the truck bed from the horizontal and the pressure applied against the tail gate by material being unloaded from the truck bed, by indexing the apertures in the end of said gate arms with selected apertures in said collar arms and bolting the arms together, the distance between the tail gate and the axis of rotation of said pivot arm may be adjusted.

4,068,893

APPARATUS FOR CONTROLLING WATER SPRAYING OPERATIONS IN MINERAL MINES

Walter Weirich, Dortmund, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Nov. 1, 1976, Ser. No. 737,332
Claims priority, application Germany, Nov. 7, 1975, 2550049
Int. Cl.[2] E21C *35/22*
U.S. Cl. 299—43 **9 Claims**



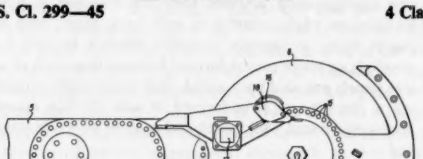
1. In a mineral mining installation which employs a mineral winning machine moved along a mineral face and waterspray nozzles for spraying water in the operating region of the machine, apparatus for controlling the operation of the nozzles, said apparatus comprising a plurality of valves connected to the nozzles to cause water to be sprayed from a selected number of nozzles when actuated, and an electromechanical device separate from the machine for generating a series of control signals in accordance with the movement of the machine as it moves along the face, said signals serving to remotely actuate the valves.

4,068,894

MINING MACHINE COWL ASSEMBLY

Eric Dring, Mansfield, England, assignor to Dale (Massfield) Limited, Mansfield, England

Filed Oct. 6, 1976, Ser. No. 729,897
Claims priority, application United Kingdom, Mar. 26, 1976, 12316/76
Int. Cl.[2] E21C *35/20*
U.S. Cl. 299—45 **4 Claims**



1. A cowl assembly for use in association with the shearing drum of a mining machine, the cowl assembly comprising an arcuate cowl member and a cowl arm connected to the cowl member, the cowl arm having an annular mounting member at

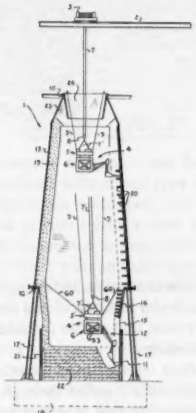
the end thereof remote from said cowl member to enable mounting of the cowl assembly in association with the shearing drum for angular movement about the axis of the drum, a power drive mechanism adapted to be supported on the mining machine and including a sprocket wheel, and a plurality of peg members arranged circumferentially on said mounting member, said peg members being cantilevered from said mounting member and being spaced from each other and from all other components of the machine with the exception of said sprocket wheel which directly engages some of said peg members.

4,068,895

DEMOLITION MACHINE FOR DELINING A FURNACE

Roy C. Reese, Wheatfield, Ind., and Richard C. Wehrle, South Chicago Heights, Ill., assignors to O. W. Reese, Inc., Wheatfield, Ind.

Filed July 1, 1976, Ser. No. 701,503
Int. Cl.[2] E04G *1/36*; E21D *7/02*
U.S. Cl. 299—70 **29 Claims**



1. A machine for use in a substantially cylindrical furnace having a vertical center axis and an inner masonry wall, said machine comprising structure provided with means for supporting a tool for demolishing at least a portion of said wall, means for suspending said structure in such a furnace, (and power operated) cable means carried by said structure (and operable independently of said suspension means) for connection with means on said furnace; and power means operable independently of said suspension means whereby said structure can be adjusted and secured centrally in said furnace or in any one of an infinite number of radial and/or circumferential stable position about such an axis in order to facilitate locating such a tool variable distances away from such an axis for operation against said wall.

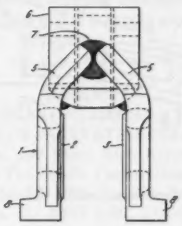
4,068,896

MINERAL CUTTER CHAINS

Sidney Ernest Proctor, High Wycombe, England, assignor to Austin Hoy & Company Limited, High Wycombe, England

Filed Oct. 12, 1976, Ser. No. 731,841
Claims priority, application United Kingdom, Oct. 23, 1975, 43675/75
Int. Cl.[2] E21C *25/34*
U.S. Cl. 299—83 **3 Claims**

1. A cutter chain having links thereof carrying supports for cutter tools, wherein the support-carrying links each comprise a pair of side members which are disposed side-by-side and adjacent to one another, the side members being arranged for articulation to other links of the chain, and each of the side members having a pair of lugs embracing a cutter tool support, said lugs having free ends, the arrangement being such that the lugs in each pair of side members project inwardly so that they



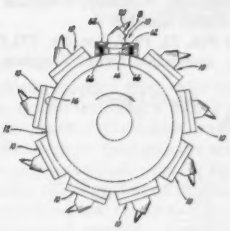
meet near the center line of the chain, and the free ends of the lugs in each pair being connected by welding.

4,068,897

REPLACEABLE CUTTING BIT HOLDER ASSEMBLY

Michael J. Amoroso, Marion, Ill., assignor to M.A.T. Industries, Inc., West Frankfort, Ill.

Filed Oct. 22, 1976, Ser. No. 734,997
Int. Cl.[2] E21C *35/18*
U.S. Cl. 299—91 **8 Claims**



1. A replaceable cutting bit holder assembly for a mining machine of the type having a movable cutter member, said assembly comprising:

a. an elongate base means fixedly attachable to the cutter member and including opposed sides extending longitudinally generally in the direction of travel and having seating means,

b. an elongate bit-holding block means including opposed sides extending longitudinally generally in the direction of travel and having means engageable with said seating means, and

c. a pair of longitudinally spaced threaded fastener means received through and connecting said block means to said base means and tending to urge said block means toward said cutter member.

4,068,898

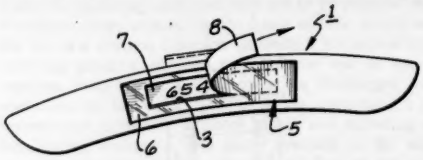
WHEEL-BALANCING WEIGHT HAVING RECORDING SURFACE

Donald E. Hanson, 986 Crane Ave., Foster City, Calif. 94404

Filed Jan. 22, 1976, Ser. No. 651,576
Int. Cl.[2] B60B *27/00*
U.S. Cl. 301—5 B **2 Claims**

1. A vehicle wheel-balance weight with a rectangular indentation having a base defining a recording surface; data on said recording surface setting forth the state of the vehicle at the time a tire is installed on said vehicle; means on said weight for adhering the same to said vehicle wheel; an adhesive tape to cover said recording surface to preserve data on the same

during use of said wheel to which said weight is adhered; and a recess peripherally surrounding said indentation to define a



shelf to which said tape is securable spaced above said recording surface.

4,068,899

BRAKING SYSTEMS

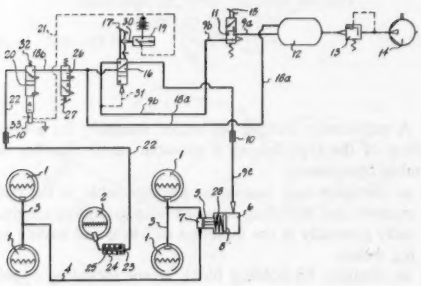
Gert Nolte, Gehrden, and Wolfgang Dittberner, Hannover, both of Germany, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Feb. 22, 1977, Ser. No. 771,125

Claims priority, application United Kingdom, Feb. 25, 1976, 07336/76

Int. Cl.² B60T *11/10*

U.S. Cl. 303—6 A 19 Claims



1. A fluid pressure operated braking system for a wheeled vehicle comprising a first braking circuit for wheel brakes, a second braking circuit for a transmission brake and means for controlling operation of said first and second braking circuits, said means including a first valve means connected to a source of fluid pressure and movable between first and second operating positions, a second valve means movable between first and second operation positions, a first conduit for conducting fluid pressure connecting said first and second valve means, a second conduit separately connected to said source of fluid pressure and to said second valve means, means connecting said second valve means to said first braking circuit in said second position of said second valve means, means connecting said second conduit to said first braking circuit in said first position of said second valve means and to said second braking circuit in said second position of said second valve means, means responsive to operation of said first valve means for moving said second valve means between said first and said second positions, means responsive to movement of said second valve means for connecting said second conduit to said second braking conduit.

4,068,900

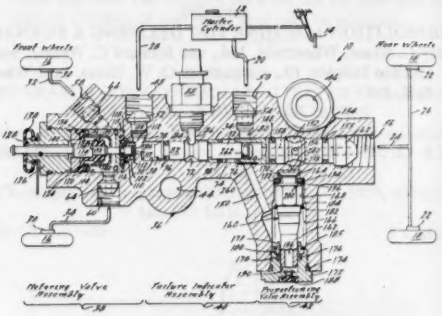
BLEND BACK PROPORTIONING BRAKE CONTROL APPARATUS

Roger E. Doerfler, Detroit, and Gary A. Willi, Taylor, both of Mich., assignors to Kelsey-Hayes Co., Romulus, Mich.

Filed Aug. 5, 1976, Ser. No. 711,775

Int. Cl.² B60T *8/26*

U.S. Cl. 303—6 C 11 Claims



2. A device for a dual brake system including a master cylinder and front and rear brake actuators, said device being located in said system between said master cylinder and said rear brake actuator and including

a housing having a fluid inlet adapted to receive fluid from said master cylinder, a fluid outlet through which fluid is adapted to be displaced to said rear brake actuator, and a chamber providing communication between said inlet and said outlet,

first valve means in said chamber actuable in response to fluid pressure at said inlet above a first predetermined pressure and below a second predetermined pressure for decreasing the transmission of fluid pressure from said outlet,

second valve means different from said first valve means and having a first area exposed to inlet fluid pressure and a second area different from said first area exposed to the difference between said fluid pressure at said fluid inlet and said fluid outlet, said inlet pressure on said first area producing a first force in a direction to open said second valve means when said fluid pressure at said inlet is above said second predetermined pressure, the fluid pressure differential between said inlet and outlet pressures on said second area producing a second force biasing said second valve means toward its open position when said fluid pressure at said inlet is above said second predetermined pressure, and

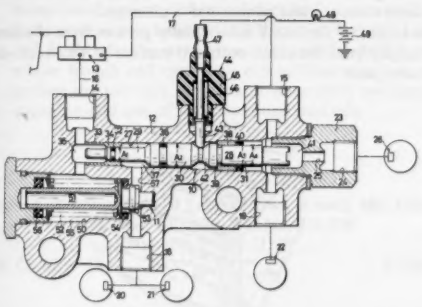
means for resiliently biasing said second valve means to its closed position, said first force and said second force being additive in opposition to the biasing force of said resilient means,

said second valve means being actuable when said fluid pressure at said inlet is above said second predetermined pressure to provide a direct flow path circumventing said first valve means and permitting fluid to flow at a controlled second rate from said inlet to said outlet, said second valve means disposed within said first valve means and movable longitudinally therein.

4,068,901
BRAKE PRESSURE DIFFERENCE WARNING SYSTEM FOR VEHICLES

Mizuo Nyunoya, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 587,050, June 16, 1975, abandoned.
This application Sept. 24, 1976, Ser. No. 726,229
Claims priority, application Japan, June 26, 1974, 49-73528
Int. Cl.[2] B60T 8/26
U.S. Cl. 303—6 C 10 Claims



1. A brake pressure difference and failure warning system operatively associated with a dual type master brake cylinder having two independent brake lines, one brake line being fluidically connected to rear wheel brakes while the other brake line is fluidically connected to front wheel brakes, comprising:

a housing provided with an axial bore therein;

a stepped piston slidably disposed within said bore and provided with a small diameter portion and a large diameter portion;

a proportioning valve assembly disposed within said one of said brake lines;

a first fluid chamber defined within said housing at one end of said small diameter portion of said stepped piston and disposed within said one brake line;

a second fluid chamber defined within said housing and around said smaller diameter portion of said stepped piston and fluidically connected to said rear wheel brakes;

a passage provided within said housing and disposed within said one of said brake lines, said second fluid chamber being normally fluidically connected to said first fluid chamber through means of said proportioning valve assembly and said passage, said proportioning valve assembly thereby controlling the pressurization of said second chamber;

a third fluid chamber defined within said housing at the large diameter end portion of said stepped piston and disposed within said other brake line;

seal means provided upon said small diameter portion of said stepped piston, and interposed between said first and second fluid chambers for permitting fluid communication therebetween when said stepped piston is axially moved;

switch means operatively connected to said stepped piston;

said stepped piston having a predetermined configuration, and the stepped portions thereof having a predetermined area ratio with respect to each other, such that said stepped piston is axially movable, so as to actuate said switch means when each one of said first and third fluid chambers is subjected to a fluidic failure; and,

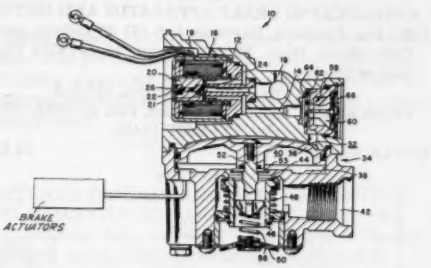
when the proportioning valve is inoperatively seated on its valve seat with said first and said second fluid chambers not subjected to fluid failure such that the hydraulic pressure within said second fluid chamber is lower than the normal hydraulic pressure supplied to said second fluid chamber, fluid communication between said master cylinder and said rear wheel brakes is established through means of said first and second fluid chambers, and said passage; and

means disposed within said axial bore for controlling the fluid communication between said first and second fluid chambers when said piston is axially moved in response to a fluidic failure.

4,068,902
ADAPTIVE BRAKING MODULATOR WITH ELECTRICALLY ACTIVATED RELAY VALVE

Brian Charles Deem, and Marc Alan Karon, both of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed Nov. 15, 1976, Ser. No. 742,152
Int. Cl.[2] B60T 8/02, 13/66
U.S. Cl. 303—28 17 Claims

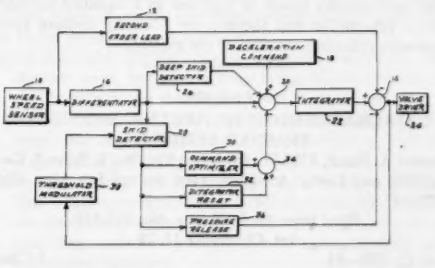


3. In an electrically actuated relay valve for a vehicle fluid pressure braking system including a fluid pressure source, a housing defining a chamber therewithin, means for communicating said chamber with the fluid pressure source, electrically actuated valve means actuable to vent the fluid pressure content of said chamber, brake application effecting means responsive to fluid pressure from said source to effect a brake application, pressure differential responsive means responsive to the pressure differential between the pressure level in the brake application effecting means and the pressure level in said chamber to vent said brake application effecting means when the pressure level in the brake application effecting means exceeds the pressure level in the chamber.

4,068,903
ADAPTIVE SKID DETECTOR THRESHOLD APPARATUS

Henrik H. Straub, Mercer Island, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1976, Ser. No. 748,579
Int. Cl.[2] B60T 8/093
U.S. Cl. 303—99 3 Claims



1. In combination with a fluidic antiskid circuit comprising a pneumatic wheel speed sensor connected to a wheel, means for

determining the rate of deceleration of the wheel, means for comparing the rate of deceleration with a preselected rate of deceleration and producing an output signal, valve means connected to the wheel braking system and adapted to receive said output signal, and means for detecting and compensating for excessive wheel deceleration, wherein the improvement comprises:

threshold detector means receiving said output signal from said comparing means, said threshold detector means applying a valve command signal to said detecting and compensating means, said valve command signal varying the threshold level within said detecting and compensating means, said valve command signal is inversely proportional to said output signal.

4,068,904

ANTI-LOCKING BRAKE APPARATUS AND METHOD

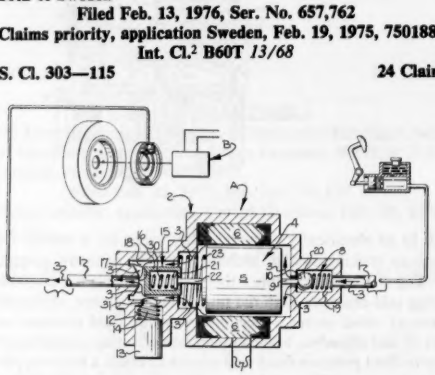
Folke Ivar Blomberg, Duvstigen 4, S-181 40 Lidingo, and Jan-Olov Martin Holst, Skogsduvevagen 14, S-75252 Uppsala, both of Sweden

Filed Feb. 13, 1976, Ser. No. 657,762

Claims priority, application Sweden, Feb. 19, 1975, 7501883

Int. Cl.² B60T *13/68*

U.S. Cl. 303—115 **24 Claims**



1. In apparatus for braking a rotating member which has fluid pressure actuated brake cylinder means for exerting force braking rotation of the member, reservoir means for supplying fluid to the cylinder means, conduit means for establishing operative communication between the cylinder means and the reservoir means, and sensor means for detecting the rate of retardation of rotation thereof and for signalling the occurrence of a rate of retardation in excess of a pedetermined rate, that improvement which comprises brake modulator means interposed in said conduit means between said reservoir means and said cylinder means for normally accommodating free flow of fluid between said reservoir means and said cylinder means through said conduit means and said modulator means, said modulator means being operatively connected to said sensor means and responsive thereto for pumping fluid through said conduit means in one of the directions of toward and away from said cylinder means in response to a signalled excessive rate of retardation and thereby for releasing braking forces otherwise retarding rotation of the member.

4,068,905

DETACHABLE ROAD PROTECTING DEVICE FOR TRACKED VEHICLES

Chester A. Black, 6303 W. 159th St., Rte. No. 1, Stilwell, Kans. 66085, and Lester A. Black, 1106 Second St., Alva, Okla. 73717

Filed Sept. 10, 1975, Ser. No. 612,217

Int. Cl.² B62D *55/28*

U.S. Cl. 305—51 **3 Claims**

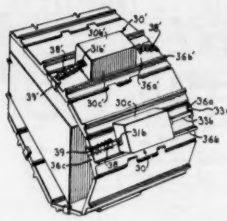
1. Track and road protecting means for use with individual track elements of an endless tracked vehicle, successive track elements of said endless track having a transverse cleat on the outboard surface thereof adjacent one end therefore, comprising, in combination:

a somewhat resilient, somewhat flexible, somewhat deformable, yet normally substantially shape-retaining block under load adapted to fit on the outboard face of a single track element of an endless track and positioned thereon,

said block substantially rectangular in plan, side and end views and having substantially rectangular, paired and parallel sets of side faces, end faces and inbaord-outbard load bearing faces,

the length of said block a substantial part of the distance from cleat to cleat of successive elements.

the height of the block substantially greater than the cleat height from the clean outboard surface of the track element, and



the width of the block at least a substantial part of the width of the track,

an elongate, non-extensible element received substantially centrally of and secured within said block and extending transversely thereof from side to side of the block,

means for removably connecting the said non-extensible element to the opposite edges of an individual track element positioned laterally of each of the side faces of said block, and

tensioning means positioned laterally of the block on each side thereof engaging one end of the said non-extensible element with an inward portion thereof and the connecting means with an outward portion thereof,

one of said tensioning means incuding a nut fixed to one end of the non-extensible element and a bolt carried by and engaging the connecting means on one side of the block.

4,068,906

SYSTEM FOR SECURING GUIDE RAILS IN MACHINE STAND

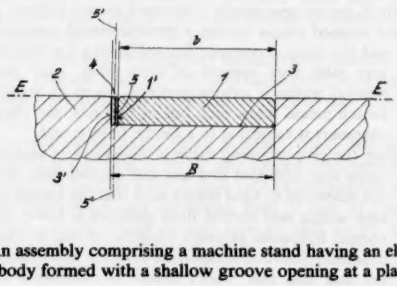
Werner Dür, St. Margrethen, and René Forster, Amriswil, both of Switzerland, assignors to Hydrel A.G., Romanshorn, Switzerland

Filed Mar. 4, 1976, Ser. No. 663,811

Claims priority, application Switzerland, Nov. 26, 1975, 15310/75

Int. Cl.² F16C *29/00*

U.S. Cl. 308—3 A **4 Claims**



1. An assembly comprising a machine stand having an elongated body formed with a shallow groove opening at a planar

surface, said groove extending along said body and having a pair of longitudinally extending flanks;

a precision guide rail of a thickness equal to the depth of said groove and received therein, said guide rail extending substantially over the length of said groove and having a face flush with said surface, said guide rail having a width less than the distance between said flanks and having a side defining with one of said flanks a longitudinally extending space while bearing on the other of said flanks; and

an elongated spring-steel strip received in said space and compressed against said one of said flanks and said side of said rail, said strip having a width equal to that of said side and further having a succession of parallel corrugations whose trough and crest axes extend transversely to said surface and said face, said troughs alternately and directly engaging said one of said flanks and said side.

4,068,907

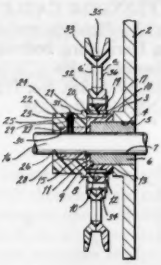
PULLEY MOUNTING

Edwin A. Zenthoefer, 3860 Londell Road, Arnold, Mo. 63010

Filed Dec. 23, 1976, Ser. No. 753,909

Int. Cl.[2] F16H *55/00*

U.S. Cl. 308—18 **6 Claims**



1. The combination with a casing having an opening in one portion thereof and a shaft of lesser diameter than said casing opening projecting outwardly therethrough, of a wheel mounting means comprising a mounting member fixed within said casing opening and projecting outwardly therebeyond, said mounting member having a bore through which said shaft extends, a fitting fixedly engaged on said mounting member in its projecting portion, a multiplicity of bearing elements arranged circumferentially about, and supported upon, said fitting, said fitting having a bearing for journalling of said shaft extending therethrough, means disposed radially outwardly of said fitting for retaining said bearing elements against displacement from operative position, a wheel having a hub portion, said hub portion being engaged upon said means retaining said bearing elements, and means interconnecting said shaft and said bearing element retaining means.

4,068,908

WRITING-TABLE AND MACHINE-TABLE COMBINATION

Dieter Horn, Backnanger Str. 40, D-7062 Rudersberg, Germany

Filed Feb. 18, 1976, Ser. No. 659,028

Claims priority, application Germany, Nov. 27, 1975, 7504835

Int. Cl.[2] A47F *5/08*

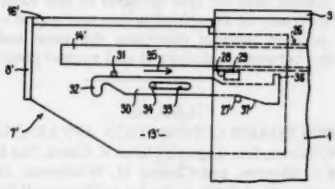
U.S. Cl. 312—30 **6 Claims**

1. A writing and machine table combination including a broad-surfaced planar table top and a movable machine drawer slidably disposable in said table below the table top, the invention comprising:

a machine-supporting plate mounted on said machine drawer;

support means associated with said plate for swingably supporting a machine below the upper surface of said plate when not in use and supporting a machine above said upper surface when in use;

positioning means coupled to said drawer for positioning said upper surface of said plate immediately in front and at the level of the upper surface of said table top when said drawer is in its outward extended position; and



swingable bottom plate means hingedly attached at the lower-front portion of said machine drawer and normally extending downwardly and rearwardly therefrom for swinging upwardly to a knee-clearing horizontal position when desired.

4,068,909

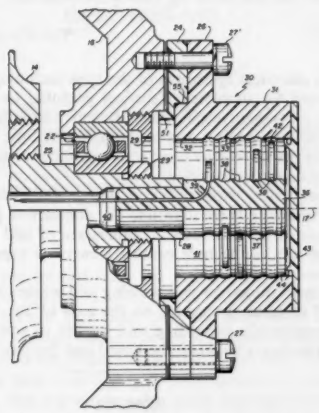
ELECTRICAL CONTACT ASSEMBLY AND METHOD AND APPARATUS FOR ASSEMBLING THE SAME

Peter E. Jacobson, Ariz., and Terry S. Allen, both of Phoenix, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,298

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—5 R **15 Claims**



1. A contact assembly for conducting electrical energy between a pair of coaxial instrument members relatively rotatable about an axis thereof comprising:

inner and outer circular, coaxial, coplanar electrically conductive rings, one of said rings being disposed on one of said members and the other of said rings on the other of said members for relative rotation about said axis, the respective diameters of said rings providing a relatively large radial gap therebetween,

a resilient, filamentary, electrically conductive loop having a free diameter greater than the radius of said gap normally compressed between said rings whereby said loop rolls on said ring surfaces upon relative rotation between said instrument members,

inner and outer cylindrical support members for said inner and outer rings carried by said instrument members, one of said support members being radially fixedly mounted

on one of said instrument members relative to said axis, and

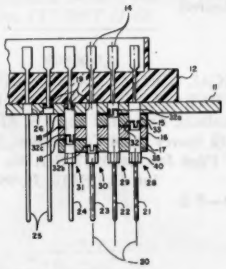
means for movably mounting the other support member on the other of said instrument members between a normal coaxial position relative to said one support member and an eccentric position relative to said one support member, the amount of said movement providing an enlarged radial gap greater than the free diameter of said loop, whereby said loop may be assembled within said gap at said eccentric position without distorting the same and is compressed between said rings at said normal position.

4,068,910

BUS BOARD CONNECTION APPARATUS

Arthur W. Brown, Los Angeles; Heinz E. Goetz, San Bernadino; Ronald J. Morrow, and Charles H. Waldhauer, Jr., both of Los Angeles, all of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 23, 1976, Ser. No. 780,627
Int. Cl.² H01R *3/06, 7/08*
U.S. Cl. 339—18 P **16 Claims**



1. In electrical apparatus of the type including at least one bus board for supplying electrical potential to a component having a conductive pin which extends through a hole in the board along a central axis of the hole, the hole being at least partially bounded by a conductive surface, an improved connection device comprising:

a transversely expansible conductive washer sized to permit positioning thereof around the conductive pin within the hole in the bus board, compression of said washer along the axis of the hole causing transverse expansion of said washer; and

expander means for compressing said washer between a pair of surfaces transverse to the axis of the hole, thereby transversely expanding said washer to achieve electrical connection between the board and the pin.

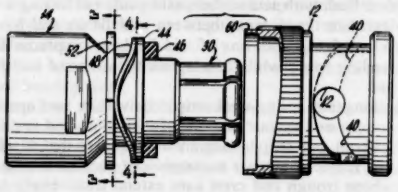
4,068,911

WASHER AND CONNECTOR ASSEMBLY

Alphonso Lodato, Corona; Americo Cornacchio, Mount Vernon, both of N.Y., and Edward M. Fox, Waldwich, N.J., assignors to Kings Electronics Company, Inc., Tuckahoe, N.Y.

Division of Ser. No. 672,136, March 31, 1976. This application Oct. 29, 1976, Ser. No. 737,150
Int. Cl.² H01R *13/54*
U.S. Cl. 339—90 R **5 Claims**

1. A bayonet type connector assembly comprising a body and a sleeve, said sleeve having at least one elongated opening therein, a spring washer and an open end washer between said body and said sleeve, shoulder means against which one end of said spring washer abuts, the other end of said spring washer abutting against said open end washer, said spring washer being firmly anchored between said open end washer and said shoulder means to allow relative movement between said sleeve and said body, said body having a forward portion and a rear portion, the forward portion being of lesser diameter than the rear portion, said spring washer, shoulder means and open end washer being mounted on said forward portion, said spring washer being slit on one side thereof to permit installation of said spring washer onto said body, said open end washer being slit at one side and being provided with at least



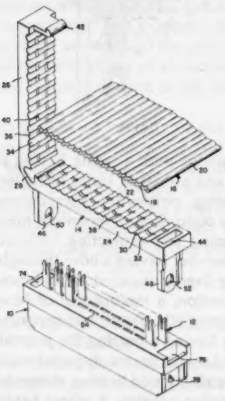
one notch cut at a point spaced from said slit a distance sufficient to permit the open end washer to have an opening large enough to permit the said washer to be mounted on said connector body.

4,068,912

CABLE CLAMPING INSULATION DISPLACING ELECTRICAL CONNECTOR FOR MULTI-CONDUCTOR FLAT FLEXIBLE CABLE

William Jeffrey Hudson, Jr., Hershey, and Johannes Cornelis Wilhelmus Bahermans, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1977, Ser. No. 772,172
Int. Cl.² H01R *13/38*
U.S. Cl. 339—99 R **7 Claims**



1. An electrical connector for electrically terminating conductors of multi-conductor flat flexible cable of the type having a plurality of conductors in side-by-side parallel spaced relationship within a web of plastic insulating material, said connector comprising:

a base member of insulating material having a plurality of cavities extending therethrough from one side thereof to another side which is opposite to said one side;

an electrical contact terminal mounted in each said cavity, each said contact terminal having a conductor receiving portion comprising a pair of spaced apart arms having opposite edges defining therebetween a conductor receiving slot, said arms extending normally beyond one side of said base member, and a mating portion directed towards said another side;

a cable clamping assembly comprising a pair of members hingedly attached at a first end and latching means at the opposite end, said clamping members having mating faces profiled to define therebetween a plurality of conductor

aligning passageways, a like plurality of slots passing through both members of said assembly each intersecting a respective one of said passageways, and clamping means securing said cable clamping assembly on said base member,

whereby upon positioning said cable in said cable clamping assembly and movement thereof towards said one side, said arms penetrate through said slots to engage in the conductors restrained in said passageways with the conductors being forced into the slot of a respective contact terminal to effect an insulation displacing engagement therebetween.

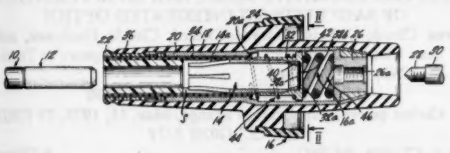
4,068,913
ELECTRICAL CONNECTOR APPARATUS

Robert J. Stanger, Alpha, and Larry N. Siebens, Great Meadows, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 610,049, Sept. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 406,281, Oct. 15, 1973. This application Nov. 8, 1976, Ser. No. 740,074

Int. Cl.[2] H01R *13/20*

U.S. Cl. 339—111 **10 Claims**



1. A contact assembly separable during energization of a high voltage circuit therethrough, comprising:

a. a housing having an open end and an axial passage extending interiorly from said open end;

b. a male contact assembly axially disposed in said passage and comprising a male contact element and an elongate member supported by said male contact element extending axially therefrom along said passage and evolving arc-quenching gas upon the striking of an arc in said passage, such gas evolving member having a first end joined to said male contact element an opposite end defining an end taper;

c. a female contact assembly in said housing and comprising a female contact element releasably engaging said male contact element and spacedly encircling said gas evolving member during said energization of a high voltage circuit through said contact assembly; and

d. said gas evolving member having an axial location of larger diameter axially spaced toward said first end from said end taper and an axial location of smaller diameter between said location of larger diameter and said end taper, thus to facilitate withdrawal of said gas evolving member from said female contact element.

4,068,914
CONNECTOR DEVICE FOR TELEPHONE TERMINALS OR HOUSINGS

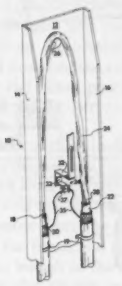
Jules A. Mack, 513 Second Ave., NW., Conover, N.C. 28613

Filed May 10, 1976, Ser. No. 685,043

Int. Cl.[2] H01R *7/28*

U.S. Cl. 339—143 R **5 Claims**

1. A connector apparatus for connecting multiple leads to a common point comprising at least two, substantially identically formed blanks, each blank comprising a body portion and a plurality of male tabs formed integrally therewith and extending outwardly therefrom at similarly spaced points around the periphery of the body portions, said blanks in the assembled position being superposed one atop the other in electrical conductive relationship with each other and with the tabs of the upper body portion protruding outwardly from the same corresponding positions as the tabs of the lower body portion, and with the tabs of the lower body portion having a first, angular relationship with the surface of said body portion and the tabs of the upper body portion having a second, more



elevated angular relationship with the surface area of said upper body portion than is the case with the tabs with the lower body portion, whereby the number of connections within a prescribed space may be maximized while permitting sufficient access room for each of said male tabs.

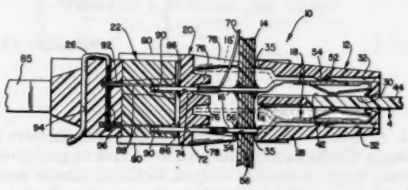
4,068,915
ELECTRICAL CONNECTOR

Robert F. Evans, New Cumberland, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 615,355, Sept. 22, 1975, abandoned. This application July 22, 1976, Ser. No. 707,610

Int. Cl.[2] H05K *1/07*

U.S. Cl. 339—176 MP **3 Claims**



1. A terminal formed from flat metal stock, said terminal comprising: an elongated base; a first cantilever spring arm extending from and bent back over the base, there being a contact surface on the free end of the arm, said first arm being disposed at an acute angle to the base; a tab bent from and overlying the base; a second cantilever spring arm extending from the tab, said second arm also being disposed at an acute angle to the base and having its free end under the free end of the first arm so that upon engagement of a printed circuit board with the first arm both arms are compressed, said second arm being work-hardened to increase its spring constant; and contact means integrally joined to said base for establishing electrical connection between said contact surface and a wire.

4,068,916
VOLTAGE TAP

Frederick Della Iacono, Crestwood; Allen Trustman, Ossining, and Donald J. LeVine, Tarrytown, all of N.Y., assignors to Kings Electronics Company, Inc., Tuckahoe, N.Y.

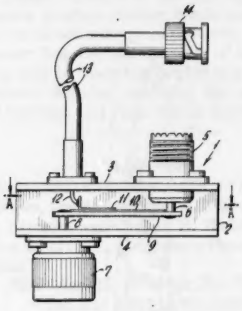
Filed Feb. 18, 1977, Ser. No. 769,876

Int. Cl.[2] H01R *17/18*

U.S. Cl. 339—177 R **4 Claims**

1. Voltage tap to a coaxial line, comprising a first coaxial line having an extended center conductor, a second coaxial line having an extended center conductor, a first metal plate elec-

trically interconnecting said extended center conductors, a second metal plate mounted parallel to and in close proximity to said first metal plate, a third coaxial line, means electrically



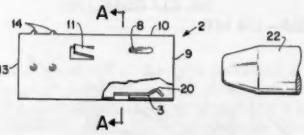
connecting the center conductor of said third coaxial line to said second metal plate and means electrically interconnecting the outer conductors of all said coaxial lines.

4,068,917

ELECTRICAL CONTACT SOCKET

Jack Harold Seidler, Flushing, N.Y., assignor to Akzona Incorporated, Asheville, N.C.

Filed Oct. 21, 1976, Ser. No. 734,569
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R **16 Claims**



12. A socket contact for use in electrical connectors comprising: a tubular member adapted to receive an associated pin contact; a spring member integral with said tubular member, said tubular member and said spring member having been stamped from a piece of sheet metal, said spring member being located entirely inside of said tubular member for protecting all of said spring member; a portion of said spring member being bent at its place of attachment with said tubular member approximately 180° from its original stamped position; a portion near the end of said spring member opposite said attachment place being bent in a direction toward the inner surface of said tubular member for receiving an associated pin contact.

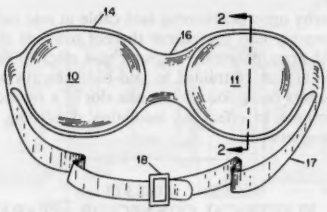
4,068,918

EYE COOLER FOR SUNBATHERS

Cressie E. Holcombe, Jr., 1613 Blackwood Drive, Knoxville, Tenn. 37921

Continuation-in-part of Ser. No. 597,839, July 21, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,471
Int. Cl.[2] G02B *3/12, 1/06*
U.S. Cl. 350—3 **6 Claims**

1. An eye cooler for providing comfort to skin of the eye region, and thus the eyes of a wearer, the cooler having a size and flexibility sufficient to conform to and contact a substantial portion of the eye region skin, which comprises: a pair of unframed lenses, each lens being formed from two overlying sheets of a flexible plastic film sealed to each other about their periphery thereby forming an internal volume, at least one of the sheets of plastic film having a thickness of about 0.02 to 0.25 mm; a liquid at substantially atmospheric pressure completely filling the interior volume of each lens, the liquid being of sufficient quantity to produce a lens thickness of about 4 to 10 mm; a nose bridge of flexible plastic film connected between



adjacent edges of the lenses; and a flexible head band attached to opposite edges of the lenses for retaining the lenses of the eye cooler in contact with the eye region skin of the wearer.

4,068,919

METHOD OF MANUFACTURING AN ELECTRON-SENSITIVE RESIN, AND AN APPLICATION OF SAID RESIN TO INTEGRATED OPTICS

Jean Claude Dubois; Maryse Gazard; Claude Duchesne, and Jean Claude Lavenu, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 9, 1976, Ser. No. 665,250
Claims priority, application France, Mar. 11, 1975, 75 07522
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96 WG **5 Claims**

5. In an optical wave guide integrated into a substrate and formed in a resin, the improvement which comprises an electrosensitive resin prepared by the process which comprises:

a. hydrolyzing phenyltrichlorosilane to phenylsilanetriol

b. polycondensing said phenylsilanetriol by:

i. heating said phenylsilanetriol to a temperature of from 250 to 300° C in a solution comprising an azeotropic mixture of diphenyl and diphenyloxide in the presence of potassium;

ii. cooling and then adding methanol to the resulting solution to precipitate the phenylsiloxanol polymers;

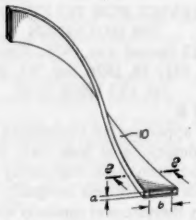
c. fractioning said phenylsiloxanol polymers to obtain a polymer fraction having the desired mean molecular weight.

4,068,920

FLEXIBLE WAVE GUIDE FOR LASER LIGHT TRANSMISSION

Michael Bass, Pacific Palisades; Elsa Garmire, Pasadena, and Thomas R. McMahon, Los Angeles, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 20, 1976, Ser. No. 716,296
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96 WG **17 Claims**



1. A hollow rectangular wave guide for transmission of radiation in the infrared portion of the spectrum, comprising:

top and bottom walls of thin flexible material with metal inner surfaces spaced apart a distance *a;* and

side walls of a flexible material and spaced apart a distance *b,* with the ratio of *b/a* at least about 4/1 and with each of *a* and *b* at least about ten times the wavelength of the infrared radiation.

4,068,921

SCREEN ASSEMBLY

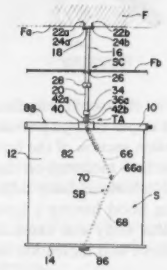
Shonosuke Okumura, Sakai, Japan, assignor to Os Screen Co., Ltd., Osaka, Japan

Filed Aug. 3, 1976, Ser. No. 711,374

Claims priority, application Japan, Jan. 7, 1976, 51-693[U]; Feb. 27, 1976, 51-24171[U]; Feb. 27, 1976, 51-24172[U]

Int. Cl.[2] G03B *21/56;* B42F *13/00*

U.S. Cl. 350—117 **5 Claims**



1. A screen assembly which comprises in combination:

a screen unit including a hollow screen casing, having a winding spindle coaxially housed within the screen casing and a screen winder operatively associated with the winding spindle, and a screen sheet having one end rigidly secured to the winding spindle within the screen casing and the other end situated outside the screen casing and a frame rod to which said other end is secured;

means for suspending the screen unit from an overhead support structure;

means including first and second upright frame members for connecting said screen unit to said suspending means, said first and second upright frame members being spaced from each other to define an accommodation space therebetween;

a tilt angle adjusting mechanism including a tiltable member and operatively accommodated within said accommodation space for adjustably tilting said tiltable member from an initial position to a maximum tilted position through one or more intermediate tilted positions, said mechanism having a plate means integrally formed with the tiltable member, the plates means having a semi-circular periphery with a plurality of sawteeth thereon equal in number to the number of positions of the tiltable member including the initial position, intermediate tilted positions and the maximum tilted position, a clutch plate of substantially segmental shape having an arcuate peripheral portion and a pair of flanks and including a notch in the arcuate peripheral portion of the clutch plate, and a latch element pivotally supported in position between the first and second upright frame members and urged in one direction, a common shaft on which the plate means and the clutch plate are pivotally mounted, said shaft being mounted between the first and second upright frame members with the arcuate peripheral portion of the clutch plate projecting slightly outwardly from the semicircular periphery of the plate means, the flanks of the clutch plate substantially facing the tiltable member and adapted to receive alternately an external pushing force from the tiltable member, the latch element being positioned for remaining engaged in the notch in the clutch plate during the pivotal movement of the tiltable member from the initial position to the maximum tilted position past the intermediate tilted positions riding over the sawteeth in the plate means with one of the flanks receiving the force from the tiltable member pivoting towards the maximum tilted position and, during return of the tiltable member back towards the initial position, the latch element being disengaged from the notch in the clutch plate and the other of the flanks receives the force from the tiltable member then pivoting towards the initial position, the return of the tiltable member back towards the initial position being initiated after the tiltable member is further pivoted beyond the maximum tilted position;

a tiltable support bar means including first and second straight sections articulated to each other, one end of the first section remote from the second section being pivotally connected to said tiltable member and one end of the second section remote from the first section being pivotally connected to the frame rod at a position substantially intermediate of the length of the frame rod, said first and second sections of the tiltable support bar means being folded close to each other when and so long as the screen sheet is not drawn out of the screen casing to a stretched position, and being brought into substantial alignment with each other when and so long as the screen sheet is drawn out of the screen casing to the stretched position, said tiltable support bar means being tiltable together with the tiltable member for corresponding tilting the screen sheet substantially about the screen casing, the screen sheet when the tiltable member is in the initial position being in a plane perpendicular to the horizontal datum.

4,068,922

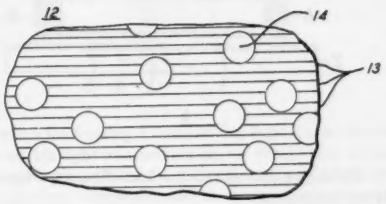
FRONT PROJECTION SCREEN

Martin Dotsko, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Oct. 1, 1976, Ser. No. 728,606

Int. Cl.[2] G03B *21/60*

U.S. Cl. 350—126 **8 Claims**



1. A semi-specular front projection screen of selective gain comprising:

a beaded film of cellulose acetate butyrate lacquer having a highly directional light scattering characteristic, said film comprising a plurality of spray coats of said lacquer with lacquer beads distributed throughout, said spray coats being derived from a spraying mixture formed by mixing 30 parts, by volume, of the following lacquer mixture:

Ingredient	Parts by Weight
Ethyl Lactate	3.0
Paraplex G-40	1.0
Di-2 Ethylhexyl Phthalate (DOP)	1.0
Toluene	2.4
Ethyl Acetate	2.4
Acetone	7.6

Ingredient	Parts by Weight
Cellulose Acetate Butyrate EAB-381-½	1.0

-continued

Ingredient	Parts by Weight
Cellulose Acetate Butyrate EAB-381-20	1.2

with 80 parts by volume of the following diluent mixture:

Ingredient	Parts by Weight
Toluene	5.6
Acetone	1.4
Ethyl Acetate	1.0; and

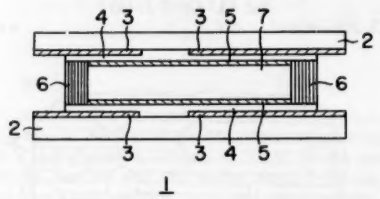
a backing member having a light reflective surface adjacent said film, the thickness of the film and the degree of reflectivity of said surface being variable to control the gain of said screen.

4,068,923

ELECTRO-OPTICAL CELL

Takashi Toida, Chiba, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,186
Claims priority, application Japan, Aug. 27, 1975, 50-103671
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 16 Claims



1. An electro-optical cell for field-effect type liquid crystal display comprising:

a pair of electrode base plates each comprising a transparent base plate and an electrode film adhering to one surface thereof;

a pair of inorganic-protecting layers respectively provided in direct contact with at least the peripheral portion of the surface of each of said electrode base plates having the electrode films thereon;

an inorganic sealing agent applied at the peripheral portions of the electrode base plates in direct contact with the respective inorganic protecting layers so as to seal said base plates together with said electrode films facing each other to form a cell containing therein a nematic liquid crystal material having a positive dielectric anisotropy, and the cell being placed on an optical path so that the light passes through the pair of electrode base plates; and

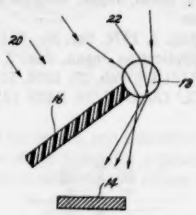
a pair of polyimide resin films respectively oriented in one direction and provided within the cell over each of the electrode films in direct contact with the nematic liquid crystal material such that the directions of the orientations of the polyimide resin films intersect each other as viewed along the optical path.

4,068,924

LIGHT COLLECTOR MEANS FOR IRRADIATING A LIQUID CRYSTAL DISPLAY DEVICE

Yasuhiro Kotani, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1976, Ser. No. 663,459
Claims priority, application Japan, Mar. 4, 1975, 50-26633; May 21, 1975, 50-68878; Sept. 23, 1975, 50-130588
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 14 Claims



1. In a housing for an electronic calculator including a calculator body having an upper surface provided with a keyboard section and an indication section of the liquid crystal type, and a shielding hood structure mounted on the end portion of the upper surface of said calculator body adjacent said indication section, said shielding hood having a lowermost end portion adjacent said calculator body and extending to an upper end portion positioned above said indication section, the improvement comprising:

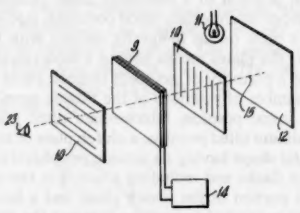
a light collector means mounted at said upper end of said shielding hood structure for refracting light beams introduced therein toward said indication section.

4,068,925

LIQUID CRYSTAL DISPLAY DEVICE

Chizuka Tani, and Fumihiro Ogawa, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1974, Ser. No. 532,855
Claims priority, application Japan, Dec. 20, 1973, 48-143308
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 13 Claims



1. A liquid crystal cell including a nematic liquid crystal of negative dielectric anisotropy disposed between a pair of transparent electrode substrates, said electrode substrates having small parallel grooves formed on their inner surfaces, said grooves on one substrate surface being perpendicular to those on the other substrate surface, an active surface agent disposed on the inner surface of at least one substrate for rendering the long axes of the liquid crystal molecules perpendicular to said inner surfaces of said substrates in the absence of a voltage applied between said substrates.

4,068,926

LIQUID CRYSTAL DISPLAY DEVICE FOR DISPLAYING COLORED PATTERNS

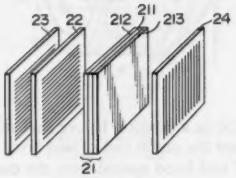
Kenji Nakamura, Kamakura, and Iwao Seno, Toyonaka, both of Japan, assignors to Japan Suncrux Co., Ltd., Tokyo, Japan

Filed June 16, 1975, Ser. No. 586,897

Claims priority, application Japan, Nov. 13, 1974, 49-137348; Nov. 13, 1974, 49-137349

Int. Cl.[2] G02F 1/13

U.S. Cl. 350—160 LC 6 Claims



1. A liquid crystal display device of twisted nematic structure which displays colored patterns comprising in combination:

a pair of spaced apart oppositely disposed transparent substrates bearing on the inside surfaces thereof a patterned electrode layer,

a layer of nematic liquid crystal material having positive dielectric anisotropy sandwiched between said pair of transparent substrates,

means for effecting a twisted nematic structure in the layer of nematic liquid crystal material,

an achromatic linear polarizer disposed outside and adjacent one of said pair of transparent substrates,

a first colored linear polarizer disposed outside and adjacent the other of said pair of transparent substrates, and

a second colored polarizer superposed with the first colored linear polarizer with the polarizing plane thereof oriented in parallel to that of the latter.

4,068,927

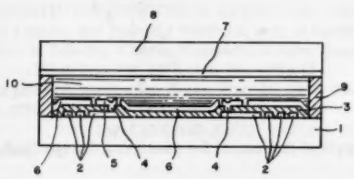
ELECTROPHORESIS DISPLAY WITH BURIED LEAD LINES

Roger Paul White, Yonkers, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,604

Int. Cl.[2] G02F 1/19

U.S. Cl. 350—160 R 7 Claims



1. An electrophoretic visual display device comprising:

An electrophoretic suspension comprising an opaque insulating liquid containing, in suspension, pigment particles of a contrasting color to that of said liquid and generally of a single polarity;

a first transparent electrode;

at least one segmented electrode and a field electrode having major surfaces in opposition to the major surface of said first transparent electrode and spaced therefrom by at least one thin insulating member;

said electrodes and said insulating members together forming a cell for containing said electrophoretic suspension;

said electrophoretic suspension positioned in said cell;

an insulating layer in contact with the surfaces of said segmented and field electrodes in reverse to those in opposition to said first transparent electrode, said insulating layer being provided with electrically conductive channels providing electrically conductive passages from said segmented and field electrodes through said insulating layer;

voltage supply means for supplying a reversible electric field between said first transparent electrodes and said segmented electrode;

electrical lead lines positioned on the surface of said insulating layer remote from said segmented and field electrode and electrically connected thereto through said electrically conductive channels and electrically conductive means electrically connecting said lead lines to said voltage supply means.

4,068,928

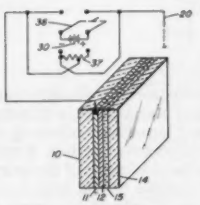
PROCESS FOR PREPARATION OF AN ELECTRODE STRUCTURE CONTAINING WO_3 USE OF THE STRUCTURE IN AN ELECTROCHROMIC CELL

Marion Douglas Meyers, Stamford, Conn., and Henry Patrick Landi, Yorktown Heights, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 565,307, April 4, 1975, which is a continuation of Ser. No. 392,165, Aug. 27, 1973, abandoned, which is a division of Ser. No. 105,882, Jan. 12, 1971, abandoned. This application July 1, 1976, Ser. No. 701,822

Int. Cl.[2] G02F 1/36

U.S. Cl. 350—160 R 3 Claims



1. A method for forming a counter-electrode for an electrochromic variable light transmission device comprising: admixing a persistent electrochromic material with a plasticizer, a polyfluoroalkylene compound, and an electrically conductive material; forming sheets of the admixture; and pressing at least one of said sheets onto a planar electrically conductive support.

4,068,929

HIGH SPEED FOCUSING TELEPHOTO LENS

Hideo Yokota, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,364

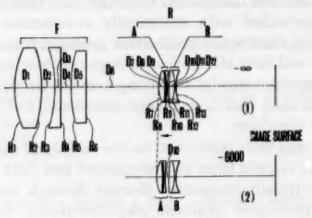
Claims priority, application Japan, Apr. 23, 1975, 50-49384

Int. Cl.[2] G02B 9/60, 9/62

U.S. Cl. 350—215 18 Claims

1. A high speed focusing telephoto lens comprising: a front lens group which has a positive refracting power and remains stationary during focusing; and a rear lens group having a negative refracting power and consisting of at least one stationary sub-group and at least one movable sub-group having a

positive refracting power, said movable sub-group being moved on the optical axis toward an object so as to cause said



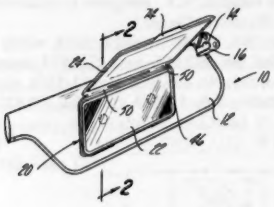
telephoto lens to focus an object at near distance from its focusing on an object at far distance.

4,068,930

VISOR ASSEMBLY AND COVERED VANITY MIRROR

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Dec. 27, 1976, Ser. No. 754,279
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—277 9 Claims



1. A visor and vanity mirror assembly comprising; a visor adapted for attachment to a vehicle, a housing supported on said visor, said housing including a relatively rigid frame portion and a relatively rigid cover portion, hinge means joining said frame and cover for movement of the latter between open and closed positions relative to said frame, said frame, cover and hinge means being of unitary, homogeneous plastic construction, said hinge means being relatively flexible and a mirror supported relative to said frame to be covered by said cover portion when the latter is in a closed position relative to said frame.

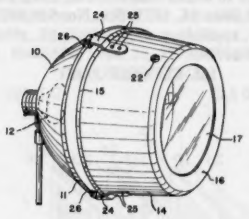
4,068,931

REFLECTOR INCLUDING LIGHT FILTER FOR PHOTOGRAPHIC USE

Bill S. Weaks, 510 S. Broadway, Plainview, Tex. 79072

Filed Oct. 5, 1976, Ser. No. 729,869
Int. Cl.[2] G02B 7/00; F21V 11/16, 9/08
U.S. Cl. 350—318 6 Claims

1. A hood for carrying a light filter for use in photography wherein a source of light is contained within a reflector body to produce light rays that are formed into a beam issuing from a source of light supported in the reflector body and the filter is interposed between the light source and the object being exposed to the reflected rays, comprising a concave reflector body defined by a flaring reflector wall having an edge forming an outlet, the wall being adapted to collect said rays issuing from said source and project a beam of light through said outlet; a hood having an enclosing wall which defines an inlet and outlet opening, said outlet opening being defined by an inwardly projecting peripheral flange on one end of said hood; a filter plate disposed within said hood, a circumferential portion of one side of the plate being in engagement with said flange; means carried by said hood interiorly thereof for engaging the periphery of the other side of said plate and thereby holding said plate against said flange; a plurality of post means carried by said hood near said inlet opening, said post means



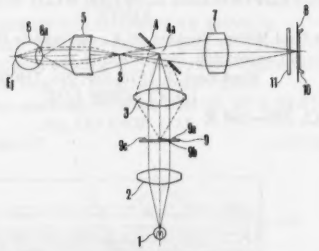
holding the hood in a position before said reflector to direct said beam toward the outlet end of said hood and to maintain the inlet end of said hood spaced from the outlet edge of said reflector so that air may circulate into the reflector.

4,068,932

OPTICAL INSTRUMENT FOR EXAMINING THE EYE FUNDUS

Shinichi Ohta, Tokyo; Isao Matsumura, Yokohama; Kazunobu Kobayashi, Yokohama, and Haruhisa Madate, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1976, Ser. No. 687,645
Claims priority, application Japan, May 23, 1975, 50-61522; Feb. 24, 1976, 51-19137; Feb. 24, 1976, 51-19313
Int. Cl.[2] A61B 3/14
U.S. Cl. 351—7 18 Claims



1. An optical instrument for examining the eye fundus comprising:

an imaging lens system for forming the image of the eye fundus of the eye to be inspected, said system including an objective lens system optically opposite to the eye to be inspected;

an image inspection means for examining the image of the eye fundus; and

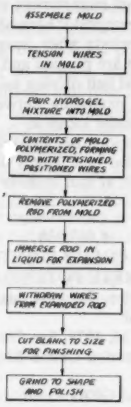
a visual line guide means for guiding the visual line of the eye to be inspected along the direction corresponding to the desired part of the eye fundus to be inspected, said means including a visible target being located at the position substantially conjugate to the eye fundus of the eye to be inspected, in the optical path of the light beam passing through the objective lens system of the imaging lens system.

4,068,933

FENESTRATED HYDROGELS FOR CONTACT LENS USE AND METHOD FOR MAKING SAME

Maurice Seiderman, 3306 Deronda Drive, Hollywood, Calif. 90068

Filed Mar. 18, 1975, Ser. No. 559,575
Int. Cl.[2] G02C *7/04;* B29D *11/00*
U.S. Cl. 351—160 7 Claims


ASSEMBLE MOLD
TENSION WIRES IN MOLD
POUR HYDROGEL MIXTURE INTO MOLD
CONTENTS OF MOLD POLYMERIZED, FORMING ROD WITH TENSIONED, POSITIONED WIRES
REMOVE POLYMERIZED ROD FROM MOLD
IMMERSE ROD IN LIQUID FOR EXPANSION
WITHDRAW WIRES FROM EXPANDED ROD
CUT BLANK TO SIZE FOR FINISHING
GRIND TO SHAPE AND POLISH

1. A method for producing fenestration hydrogels adapted for use as ophthalmic corrective contact lenses comprising the steps of:

a. confining unpolymerized hydrogel monomers within a container;

b. adjustably tensioning a plurality of spaced, substantially parallel elongate, substantially uniform members disposed within said container;

c. polymerizing said confined hydrogel monomers to a solid, non-swollen infusible mass;

d. disposing said polymerized hydrogel with uniform members in a swelling agent for said hydrogel; and

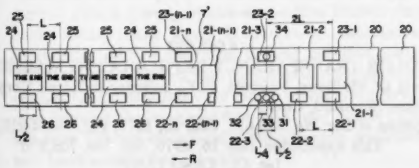
e. withdrawing said uniform members intact from said hydrogel thereby yielding a hydrogel casting characterized as possessing a plurality of fenestrations corresponding to the regions defined by said removed elongate members, and whereby said uniform members are capable of reproducible reuse.

4,068,934

AUTOMATIC INFORMATION RETRIEVAL DEVICE

Atsuyuki Tanaka, and Nobuaki Nishioka, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Dec. 10, 1975, Ser. No. 639,612
Claims priority, application Japan, Dec. 16, 1974, 49-145387; Dec. 16, 1974, 49-145388; Dec. 16, 1974, 49-145389
Int. Cl.[2] G03B *23/12*
U.S. Cl. 353—26 A 5 Claims



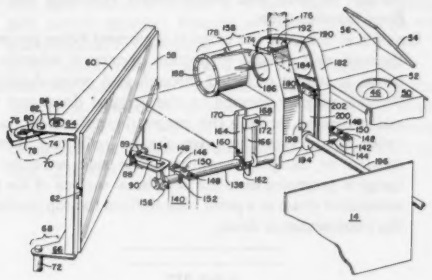
1. An automatic information retrieval device for use with an information film having an opaque leading end porion, a plurality of information containing frames following said leading end portion, light transmitting blip marks in a position corresponding to each of said information containing frames, and a plurality of dummy frames at the trailing end portion following said information containing frames, the device comprising a light source and a projecting means operatively associated with said light source for projecting said information containing frame onto a screen, means for transporting said film past said light source and projecting means in a first direction for forwarding the film and in a second direction for reversing the film, means designating a desired frame number of said information containing frames which it is desired to project, a photo-sensing means positioned adjacent the path of the film for receiving light transmitted through said blip marks and generating a pulse signal at the passage of every blip mark, a counter to which said photosensing means is connected, a first means associated with said counter and said designating means and coupled to said transporting means for disabling said transporting means for stopping the film with the designated frame positioned relative to said light source and projecting means for projecting the designated frame onto said screen, a second means associated with said counter and coupled to said transporting means for disabling said transporting means upon detection of said leading end portion by said photosensing means as said film is transported in said second direction, and a third means associated with said counter means and coupled to said transporting means for disabling said transporting means when said dummy frames are projected onto said screen while the film is transported in said first direction.

4,068,935

BACKLASH FREE LENS FOCUSING APPARATUS

Richard H. Koester, Rochester, and Roy E. Hickey, Honeoye Falls, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,879
Int. Cl.[2] G02B *7/02;* G03B *21/22, 3/00*
U.S. Cl. 353—71 4 Claims



1. A lens focusing apparatus comprising:

a lens carrier having a first section spaced apart from a second section;

said lens carrier including a first objective lens in alignment with a first condensing lens; and

a second objective lens in alignment with a second condensing lens.

said first objective lens and said second objective lens carried in said first section; and

said first condensing lens and said second condensing lens carried in said second section.

said lens carrier mounted on a shaft and adapted for axial displacement along said shaft:

a rotatably mounted cam disposed between said first section and said second section; and

a force biasing means disposed between said cam and said second section to urge a surface portion of said first section against said cam;

whereby rotation of said cam causes axial displacement of said lens carrier relative to said shaft.

4,068,936

OPTICAL PROJECTION APPARATUS FOR IMAGE TRANSFER TYPE ELECTROPHOTOGRAPHIC COPIERS

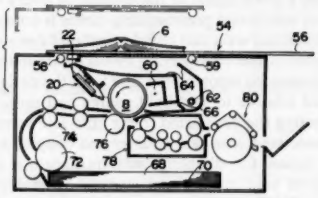
Teizo Kushima, Osaka; Takaji Kurita, Kawachinagano, and Hiroaki Mizunoe, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1976, Ser. No. 753,099

Claims priority, application Japan, Dec. 28, 1975, 50-176893[U]

Int. Cl.² G03B 27/00, 15/28

U.S. Cl. 355—1 4 Claims



1. An optical projection apparatus for use in an image transfer type electrophotographic copier for projecting an optical image of an original document to a photosensitive drum comprising:

an image transmitter formed by a bundle of optical fibers of graded refractive indexes disposed obliquely relative to the original document to be copied;

two prism-shaped reflecting members respectively disposed in facing relation to each end of the image transmitter, each of said prism-shaped reflecting members including a prism portion and a support portion integrally formed therewith;

means for supporting said image transmitter and the support portion of each said prism-shaped reflecting members fixed therebetween;

the optical image of the original document being projected through said optical projection apparatus wherein the image is at first reflected through said prism-shaped reflecting member located on the original document side, and projected through the image transmitter and further reflected through the prism-shaped reflecting member located on the photosensitive drum side, whereby the image is projected onto the peripheral surface of the photosensitive drum at a point remote from the top portion of the photosensitive drum.

4,068,937

COPIER IMAGE TRANSFER SYSTEM

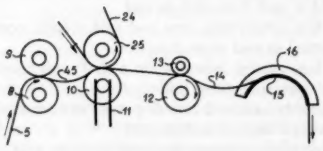
Adrianus H. Willemse, Grubbenvorst, and Mathias J. J. M. Vola, Sittard, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Mar. 4, 1976, Ser. No. 663,971

Claims priority, application Netherlands, Mar. 11, 1975, 7502874

Int. Cl.² G03G 15/16

U.S. Cl. 355—3 TR 14 Claims



1. In a copying apparatus comprising a first support movable to supply on its surface electrostatic or powder images and a movable intermediate support having a surface adapted to receive said images by transfer from said first support, at least one of said supports being an endless belt;

respective driving means for said supports for moving them continuously and operative to drive said belt at a speed greater than the speed of the other of said supports;

means operable while said supports are moving to press them together at a transfer location downstream from said belt driving means so that said belt will be driven at said location by frictional engagement with and at the lower speed of said other support for transfer of an image, and to disengage said supports after image transfer, whereby while said supports are pressed and moving together the greater speed of said belt driving means produces slack in the length of belt extending between said belt driving means and said transfer location;

and means operative upon disengagement of said supports to displace slack in said belt length downstream from and thus tension the belt at said transfer location.

4,068,938

ELECTROSTATIC COLOR PRINTING UTILIZING DISCRETE POTENTIALS

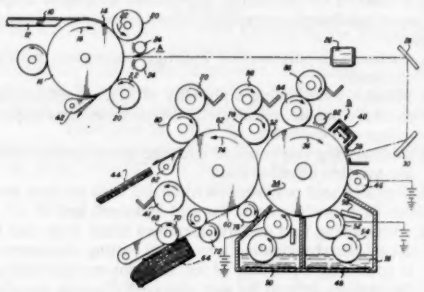
Robert Robertson, London, England, assignor to Rank Xerox Ltd., London, England

Filed June 16, 1975, Ser. No. 587,479

Claims priority, application United Kingdom, Sept. 24, 1974, 41465/74

Int. Cl.² G03G 15/01, 15/10

U.S. Cl. 355—4 11 Claims



1. An apparatus for rendering visible an electrostatic latent image having a portion thereof with an image potential greater than a first threshold and a second portion thereof with an image potential less than a second threshold, the second threshold being less than the first threshold, wherein the improvement includes:

a developer unit applying particles of a first color to the first portion of the latent image and particles of a second color to the second portion of the latent image

further including means for selectively discharging the electrostatic latent image to a potential less than the second threshold in portions thereof having a potential greater than the second threshold by a preselected level.

4,068,939

COLOR TRANSPARENCY REPRODUCING MACHINE

Louis D. Mailloux, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 540,617, Jan. 13, 1975, Pat. No. 4,027,962.

This application July 16, 1976, Ser. No. 705,870

Int. Cl.² G03G 15/01

U.S. Cl. 355—4 6 Claims

1. An electrophotographic printing machine for reproducing a color transparency, including:

a platen;

means for projecting a light image of the color transparency onto said platen;

a screen member disposed on said platen for modulating the light image of the color transparency projected onto said platen to form a half-tone light image thereof;

a photoconductive member;

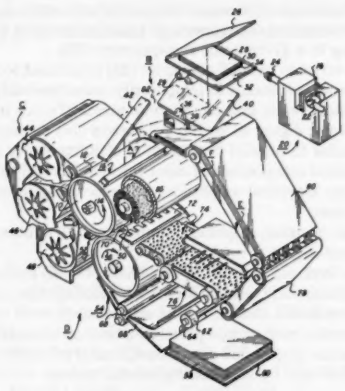
means for charging at least a portion of said photoconductive member;

means for filtering the half-tone light image;

a composition frame disposed on said platen defining an opaque border extending outwardly from the color transparency image formed on said platen;

means for exposing the charged portion of said photoconductive member to a light image of said composition frame and the filtered half-tone light image of the color transparency to record a combined electrostatic latent image of the color transparency and said composition frame on said photoconductive member;

means for developing the combined electrostatic latent image recorded on said photoconductive member with toner particles complementary in color to the color of the filtered half-tone light image, said developing means comprising a first developer housing defining a chamber storing a developer mix comprising carrier granules and yellow toner particles, first conveyor means mounted for



movement within the chamber of said first developer housing and arranged to move the developer mix from a first region to an intermediate region, first rotary driven transport means mounted within the chamber of said first developer housing and arranged to move the developer mix from the intermediate region to a second region for discharge thereat, first rotary driven developer means mounted within the chamber of said first developer housing closely proximate to said first transport means for receiving the developer mix therefrom and arranged to deposit yellow toner particles onto a blue filtered electrostatic latent image when in operative communication therewith, and first means for driving said first conveyor means such that the reaction torque to the driving moment applied to said first conveyor means pivots said first developer housing disposing said first developer means adjacent the blue filtered electrostatic latent image recorded on said photoconductive member;

means for transferring the toner powder image adhering to the combined electrostatic latent image recorded on said photoconductive member to a sheet of support material; and

means for fusing the toner powder image to the sheet of support material.

4,068,940

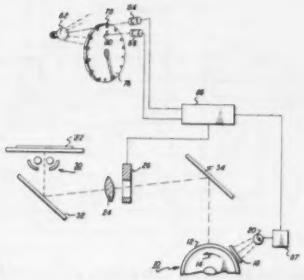
VARIABLE CONTRAST OPTICAL SCREENING SYSTEM

Richard M. Bobbe, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 13, 1976, Ser. No. 722,448

Int. Cl.[2] G03G *15/01*

U.S. Cl. 355—4 **8 Claims**



1. An electrophotographic printing machine for reproducing an original document, including:

a photoconductive member;

means for charging at least a portion of said photoconductive member to a substantially uniform level;

means for exposing the charged portion of said photoconductive member to a light image of the original document to record thereon the latent image thereof;

means for filtering the light image to expose the charged portion of said photoconductive member to successively differently colored light images corresponding to different colors of the original document;

a screen member;

a first light source arranged to project light rays through said screen member forming a screen pattern on said photoconductive member;

a power supply coupled to said first light source; and

means, responsive to the color of the light image exposing said photoconductive member, for adjusting said power supply to vary the voltage exciting said first light source to regulate the intensity of the light rays emitted from said first light source.

4,068,941

MICROFICHE RECORDS

Harry Arthur Hele Spence-Bate, 1 Cheam Place, Morley, Australia (6062)

Filed Sept. 14, 1976, Ser. No. 723,599

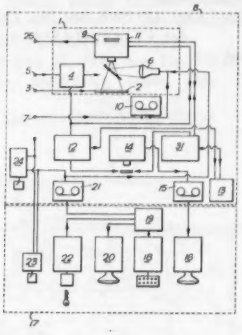
Claims priority, application Australia, Sept. 18, 1975, 3241/75

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—5 **17 Claims**

1. Apparatus for handling information comprising a microform camera including a document copying platen, a microform film holder, and a cathode ray tube, means for recording an image from either the copying platen, film holder or tube onto a further microform film held on a moveable carriage in the camera, means for moving the further film to an image recording position so that images can be recorded in different frames on the film, and electronic scanner for scanning each recorded image, a first store arranged to store the electronic scanned image, a first display for displaying the image stored in

the first store, a keyboard generating characters, a second store storing the generated characters and a second display for



displaying the generated characters, the second store feeding said cathode ray tube.

4,068,942

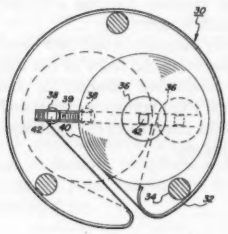
ADVANCED PHOTORECEPTOR

Richard C. Penwell, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 14, 1975, Ser. No. 621,890

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—16 **3 Claims**



1. Advanceable photoreceptor apparatus comprising:

a hollow drum having slot means substantially coextensive with the longitudinal axis of said drum;

an elongated photosensitive web;

means for supporting a major portion of said photosensitive web internally of said drum while a smaller portion thereof is trained through said slot means over the outer surface of said drum, said major portion supporting means comprising a supply member and a takeup member;

means for effecting periodic movement of said photosensitive web from said supply member to said takeup member;

means for stationarily supporting said supply and takeup members in various positions internally of said drum;

means for effecting periodic repositioning of said members independently of movement of said photosensitive web after a predetermined quantity of photoreceptor has been transferred from said supply member to said takeup member; and

said means for periodically repositioning said members including a threaded rod operatively coupled to supports for said members.

4,068,943

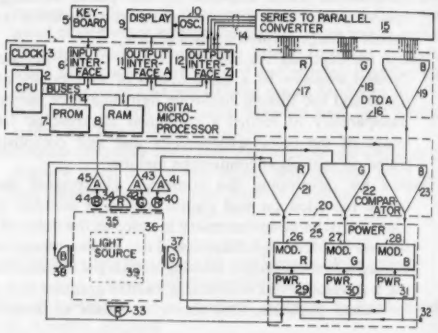
ADDITIVE COLOR PRINTER CONTROL

Robert Paul Gyori, Studio City, Calif., assignor to De luxe General, Incorporated, Hollywood, Calif.

Filed Aug. 18, 1976, Ser. No. 715,610

Int. Cl.[2] G03B *27/78, 27/32*

U.S. Cl. 355—38 **6 Claims**



2. An additive color printer control, comprising;

a. digital microprocessor means **(1)** for accepting electrically represented components of color information corresponding to a given color transparency **(39)**,

b. a series to parallel converter **(15)** connected to said microprocessor means to temporarily, simultaneously and separately retain said plural components of color information,

c. plural digital to analog converters **(16)** connected to said series to parallel converter to simultaneously accept said plural components of color information and to form separate electrical amplitudes corresponding to said components,

d. an electrical amplitude comparator **(20)** connected to each said digital to analog converter, and

e. a feedback circuit **(25, 35, 40, 42, 44, 20)** including plural illumination means for color printing also individually connected to each said comparator,

whereby each of said plural illumination means is energized according to said plural components of color information provided by said microprocessor means.

4,068,944

MICROFILM VIEWER HAVING ENLARGED COPY PRODUCTION ATTACHMENT

Max Leibundgut, Wadenswil, Switzerland, assignor to Alos AG, Zurich, Switzerland

Filed Mar. 19, 1976, Ser. No. 668,812

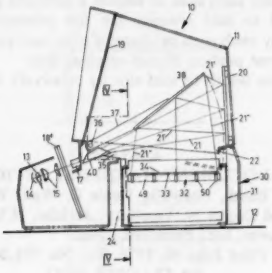
Claims priority, application Switzerland, Mar. 26, 1975, 3874/75

Int. Cl.[2] G03B *13/28*

U.S. Cl. 355—45 **11 Claims**

1. A table-top microfilm viewer and separate attachment device for producing enlarged copies of the microfilm, said viewer including a cabinet containing a light means, a microfilm holding device, a projection lens, means for deflecting a light beam issuing from said lens, and a projection screen onto which the light beam is deflected for viewing the transillumination; said light means and said projection lens being so disposed that an optical axis common to said light means and to said projection lens lies at an angle of between 10° and 30° to a horizontal plan; said deflecting means comprising a single surface first mirror mounted a predetermined spacing from said screen within said cabinet and lying in a substantially vertical plane for deflecting the light beam onto said projection screen; said cabinet having removable means for forming an opening therein below the area between said screen and said first mirror, and said cabinet being formed so as to provide an

undercut portion below said opening and above a tabletop; a separate attachment device for producing enlarged copies of the microfilm removably positionable in said undercut portion, said device comprising a housing, means connected to said housing supporting a single surface second mirror, a horizontally disposed platform means in said housing, means for positioning a light-sensitive material on said platform means, and said support means for said second mirror being pivotable so as to position said second mirror through said opening in said cabinet and into said area between said first mirror and said screen so as to deflect the light beam from said first mirror onto said platform to illuminate said light-sensitive material.

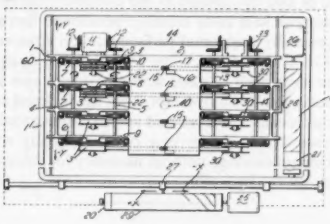


4,068,945

MICROFORM EDITORS

Harry Arthur Hele Spence-Bate, 1 Cheam Place, Morley, Australia (6062)

Filed Sept. 3, 1976, Ser. No. 720,503
Claims priority, application Australia, Sept. 8, 1975, 3069/75
Int. Cl.[2] G03B *27/42, 27/64, 27/44*
U.S. Cl. 355—54 **5 Claims**



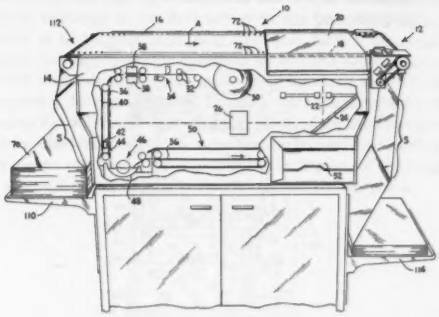
1. A microform copying apparatus comprising a housing, a camera lens, a first carriage moveable in an X and Y direction in relation to the camera lens, means for holding a plurality of rolls of microfilm on said carriage, means for moving said microfilm past windows defined by apertures in said carriage, microfiche holding means moveable in an X and Y direction in relation to the camera lens, illumination means associated with said carriage for projecting an image from a selected said roll of film onto a microfiche held on said microfiche holding means, whereby images from the microfilm transfer to the microfiche.

4,068,946

DOCUMENT FEEDING APPARATUS

Earl E. Eschweiler, Jr., Norwalk, and Richard B. Smith, Ridgefield, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,572
Int. Cl.[2] G03B *27/32, 27/52*
U.S. Cl. 355—64 **16 Claims**



1. An apparatus for automatically incrementally feeding a continuous fan-folded document having interconnected segments over the illuminating station bed plate of an electrostatic photocopier and for sequentially positioning each segment of the document on the bed plate to be photocopied; said apparatus comprising:

A. drive means for engaging the document and advancing it over the photocopier bed plate;

B. a motor for supplying motive power to said drive means;

C. clutch means through which said motor is coupled to said drive means for controlling the supply of motive power thereto;

D. brake means coupled to said drive means for stopping said drive means from advancing the document over the photocopier bed plate;

E. feed control means electrically connected to the photocopier to be signalled thereby

1. for engaging said clutch means and releasing said brake means when copying of a given segment of the document is completed to feed the next segment of the document to the photocopier bed plate, and

2. for engaging said brake means and releasing said clutch means when the next document segment is positioned on the photocopier bed plate and

F. lobe means connected to said feed control means to control the feeding of the next segment of said document.

4,068,947

OPTICAL PROJECTION AND SCANNING APPARATUS

Jere D. Buckley; David A. Markle, both of Norwalk, Conn.; William H. Newell, Mount Vernon, N.Y., and Abe Offner, Darien, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 339,860, March 9, 1973, abandoned.
This application Mar. 29, 1976, Ser. No. 671,653
Int. Cl.[2] G03B *27/58, 27/62*
U.S. Cl. 355—72 **8 Claims**

1. Apparatus for photographically exposing an image-receiving surface to a light image of an object, said apparatus comprising:

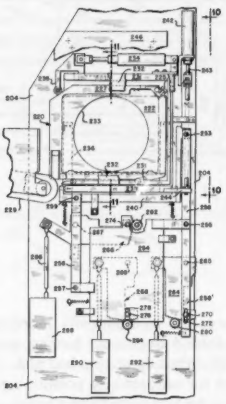
an optical system having an optical axis and conjugate planes;

a carriage;

separate stages on said carriage for supporting an object surface and an image-receiving surface in said conjugate planes, respectively, each of said stages including four link

members pivotally interconnected at points defining a parallelogram, one link member of each parallelogram being adapted for supporting thereon such object and image receiving surfaces, respectively;

means to rotate a second link member in each parallelogram respectively opposite said one link member thereof, rotation of said second link member causing concomitant rotation of an object surface and imagereceiving surface supported on said one link member of the respective parallelogram; and



means to translate said second link member of each parallelogram and means to rotate a third link member in each parallelogram, translation of said second link member in each parallelogram causing concomitant translation of such object and image-receiving surfaces in one direction and rotation of said third link member in each parallelogram causing concomitant rotation of such object surface and image-receiving surface in a direction substantially normal to said one direction.

4,068,948

COPYING APPARATUS

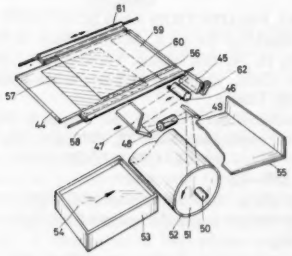
Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

Continuation-in-part of Ser. No. 592,846, July 3, 1975. This application Mar. 18, 1976, Ser. No. 668,182

Claims priority, application Germany, July 4, 1974, 2432424; Feb. 13, 1975, 2506127

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **10 Claims**



1. A copying method comprising the steps of:

supporting an original face down on a transparent support;

interposing a mask having two parts forming a slot between said original and said support and exposing only a portion of said original through said slot to a scanner on the other side of said support;

repeatedly scanning said original through said support with said scanner and producing a succession of copies each carrying only that portion of the original exposed during the respective scan through said slot;

automatically relatively displacing said original and said mask after each scan to expose a different portion of said original to said scanner for the subsequent scanning, whereby each scan produces a copy carrying a replica of a different portion of said original; and

varying the width of said slot by relatively displacing said parts.

4,068,949

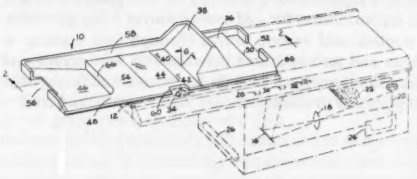
DOCUMENT HANDLING DEVICE

Richard A. Booth, Norwalk; Denis C. Weil, Wilton, both of Conn., and Daniel N. Yanofsky, Jericho, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 30, 1976, Ser. No. 701,243

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **9 Claims**



1. Document handling device for facilitating manipulation of a plurality of documents for successively copying said documents on a copying machine having a reciprocating document carriage operating with a copying stroke and a reverse non-copying stroke, said device comprising:

A. a generally rectangular body member dimensioned to rest upon the reciprocating document carriage of a photocopying machine,

B. a substantially steeply inclined surface portion adjacent one end of said body member for supporting documents thereon in an inclined stack,

C. means to prevent said documents from sliding down said inclined surface,

D. access means in said body member for permitting illumination from the copying machine to strike the undersurface of said documents as the document carriage reciprocates with said body member positioned thereon, and

E. a generally horizontal surface portion adjacent the other end of said body member for receiving documents after they have been copied, whereby documents are simultaneously fed by an operator from the inclined stack to said access means and from said access means to said receiving surface during the reverse or non-copying stroke of the document carriage without necessity for substantial movement by the operator.

4,068,950

VARIABLE PLATEN COVER

Hidetoshi Kito, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed June 22, 1976, Ser. No. 698,664

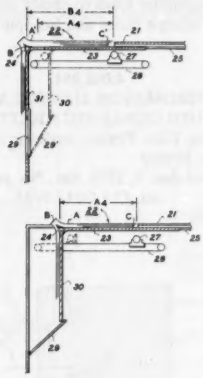
Claims priority, application Japan, Oct. 15, 1975, 50-139462[U]

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **16 Claims**

1. In an electrophotographic copying machine in which an original copying platen is mounted at one side of the body of the copying machine, and the platen has an exterior corner edge providing for bound document copying with the docu-

ment binding placed over the platen corner, and wherein the platen is stationary during the copying of documents thereon, and wherein the copying machine has movable optical scanning means for scanning a document on the stationary platen, and wherein the scanning means has a scan starting registration position adjacent an interior side of the platen opposite from said corner of the platen, and wherein said scanning means has



a platen scanning direction from said registration position towards said corner; the improvement comprising means for movable repositioning said platen, relative to said body of said copying machine toward or away from said scanning direction of said scanning means for changing said scan starting registration position of said scanning means relative to said platen in order to change the effective size of said platen scanned by said scanning means for different sizes of originals.

4,068,951

DISTANCE MEASURING APPARATUS

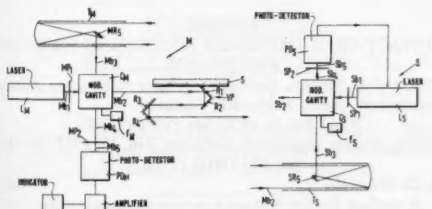
Keith Davy Froome, and George Russell, both of Teddington, England, assignors to National Research Development Corporation, England

Filed Apr. 27, 1976, Ser. No. 680,850

Claims priority, application United Kingdom, May 7, 1975, 19218/75

Int. Cl.[2] G01C 3/08

U.S. Cl. 356—5 **10 Claims**



1. A distance measuring apparatus comprising: a first unit comprising a first modulating means for polarization modulating at a first high frequency a first optical beam carrier radiation and a first transmitting means for transmitting the first optical carrier radiation over a path the length of which is to be measured; and a second unit comprising receiving means for receiving the polarization modulated first optical radiation after said first modulated light has traversed the path the length of which is to be measured, a second modulating means for polarization modulating at a second high frequency a second optical beam carrier radiation, means for supplying the received first optical radiation to said second modulating means so as to produce a low down-converted frequency corresponding to the difference between the first high frequency modulation and the second high frequency modulation, a further modulating means for modulating said second optical carrier radiation at the low down-converted frequency corresponding to the difference between the first high frequency modulation and second high frequency modulation to produce separate modulation of said second optical carrier radiation, and second transmitting means for transmitting the combined low frequency and high frequency modulated second optical carrier radiation to the first unit over the path the length of which is to be measured, said first unit further comprising means for supplying the received modulated second optical carrier radiation to said first modulating means so as to provide frequency down-conversion thereof, detecting means for detecting the polarization modulation phase of the second optical carrier after frequency down-conversion by said first modulating means and means for providing an indication of the length of the path based on said polarization modulation phase.

4,068,952

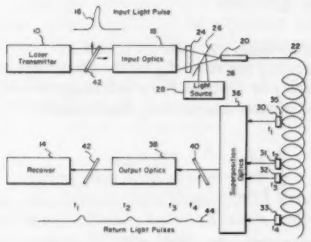
RANGE TESTING SYSTEM HAVING SIMULATED OPTICAL TARGETS

Virgil Erbert, Albuquerque, N. Mex., and Leroy O. Braun, Marina Del Rey, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 23, 1976, Ser. No. 708,168

Int. Cl.[2] G01C 3/08

U.S. Cl. 356—5 **8 Claims**



1. A test unit for a laser range finder comprising a laser transmitter and laser receiver, said laser range finder having a signal transmission path and a single signal reception path comprising:

an optical waveguide comprised of a plurality of sequential sections including an input section, each section having ends;

input optical means positioned to direct light energy in said signal transmission path to an input end of said input section;

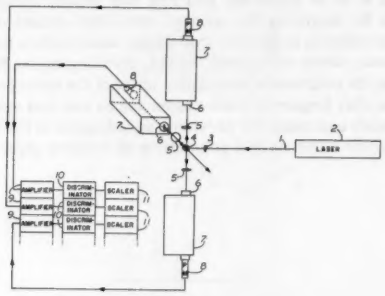
signal sampling means including a plurality of sampling structures each coupling the corresponding ends of sequential sections to provide gaps of a predetermined length for tapping a portion of the light energy from said optical waveguide, and

superposition optical means for directing the sampled light energy to said single signal reception path.

4,068,953
RAMAN SCATTERING METHOD AND APPARATUS FOR MEASURING ISOTOPE RATIOS AND ISOTOPIC ABUNDANCES

Robert C. Harney, 5665 Charlotte Way, No. 80, Livermore, Calif. 94550, and Stewart D. Bloom, 141 Via Serena, Alamo, Calif. 94507

Filed Apr. 11, 1975, Ser. No. 567,373
Int. Cl.[2] G01J 3/44
U.S. Cl. 356—75 25 Claims



1. A method for measuring isotope ratios and isotopic abundances, comprising the steps of:

a. directing a beam of quasi-monochromatic photons onto a sample to be analyzed, thereby causing each isotopic species in the sample to Raman-scatter photons at discrete frequencies characteristic of each of said species,

b. utilizing detectors for measuring the intensity of said scattered photons for each isotopic species of interest,

c. generating the fractional abundance, f_j, of an isotope j of an element X by inserting the respective measured photon intensities in the equation:

$$f_j = \frac{\sum_k n_{kj} I_{mk} \epsilon_k^{-1}}{\sum_k n_{kX} I_{mk} \epsilon_k^{-1}}$$

and determining the value of f_j, and

d. generating the ratio, R_{ij}, of the abundance of isotope i to isotope j of element X by inserting the respective measured photon intensities in the equation:

$$R_{ij} = \frac{\sum_k n_{ki} I_{mk} \epsilon_k^{-1}}{\sum_k n_{kj} I_{mk} \epsilon_k^{-1}}$$

and determining the value of R_{ij},

where n_{ki} and n_{kj} are the number of atoms of isotope i and isotope j, respectively, per molecule of isotopic species k, where n_{kX} is the total number of atoms of element X per molecule of isotopic species k, where I_{mk} is the measured scattered photon intensity for isotopic species k, where ϵ_k is the effective efficiency of the detector for photons scattered from isotopic species k, and where the summations, Σ, are carried out over the total number of isotopic species of interest.

11. An apparatus for measuring isotope ratios and isotopic abundances, comprising the combination of:

a. a laser,

b. a sample cell adapted to contain a sample whose isotope ratios and isotopic abundances are to be measured,

c. means for holding said sample cell in the laser beam,

d. an optical system for directing and focusing said laser beam into said sample cell, thereby causing each isotopic species in the sample to Raman-scatter photons at discrete frequencies characteristic of each of said species,

e. two monochromators,

f. two optical systems for collecting and focusing the Raman-scattered photons onto the entrance slits of said monochromators,

g. two photomultiplier tubes, one for each monochromator,

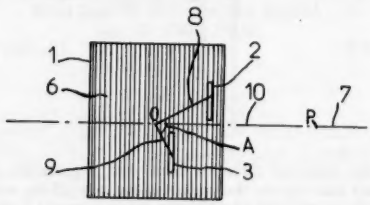
h. a power supply to energize the photomultiplier tubes, and

i. means for electronically processing the output signals from said photomultiplier tubes to obtain data representative of the desired isotope ratios and isotopic abundances.

4,068,954
MONOCHROMATOR HAVING A CONCAVE HOLOGRAPHIC GRATING

Edouard Da Silva, Lille, France, assignor to Instruments S.A., Ivry-sur-Seine, France

Filed Jan. 9, 1976, Ser. No. 647,767
Int. Cl.[2] G01J 3/18
U.S. Cl. 356—100 6 Claims



1. In a monochromator adapted for the study of RAMAN spectrums having a turntable concave holographic grating with parallel lines and an inlet slot parallel to the lines of the grating for passage of incident light and an outlet slot also parallel to the lines of the grating, for passage of diffracted light, an improvement wherein said inlet and outlet slots are each disposed on opposite sides of a diametral median plane of the grating extending perpendicular to the lines of the grating and passing through the center of the grating, the bisector of the angle formed by two lines connecting the center of each slot to the center of the grating being contained in said diametral plane, the slots being additionally disposed such that the projection of said angle on the diametral plane is $\leqq 3°$ and the projection said angle on a second plane passing through the bisector and perpendicular to the diametral plane is $\leqq 15°$.

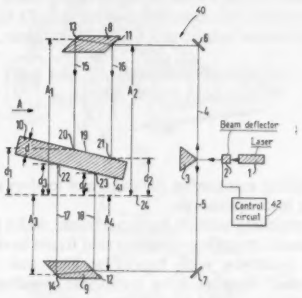
4,068,955
CONTACT-FREE THICKNESS MEASURING METHOD AND DEVICE

Viktor Bodlaj, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 9, 1976, Ser. No. 647,669
Claims priority, application Germany, Jan. 13, 1975, 2501015
Int. Cl.[2] G01B 11/06
U.S. Cl. 356—167 3 Claims

1. A method for the contact-free measurement of the thickness of a workpiece having first and second surfaces which are opposite and plane-parallel to each other, said workpiece being disposed adjacent a reference plane of a device having means for providing a laser beam, means for splitting the laser beam into at least two sub-beams, means for directing the sub-beams to opposite sides of the reference plane, means for reflecting at least a portion of each of the sub-beams at the reference plane and having at least one reflecting surface on each side of said reference plane so that each of said first and second surfaces of the workpiece is struck by at least one portion, means for causing each of the portions to move periodically across the respective surface of the workpiece from an initial position and back, and separate sensing means associated with each of the portions for detecting a beam reflected by a scattering point on one of said first and second surfaces arriving along a given

path, each portion while in the initial position and the given path for the associated sensing means intersecting at a point in the reference plane with the initial position forming an angle α with a normal of the reference plane and the given path forming an angle β with the normal, said method comprising splitting the laser beam; directing the sub-beams; creating two separate spaced portions of each sub-beam and reflecting the portions at the first and second surfaces of the workpiece; deflecting said portions from the initial position, so that two



portions move along each of said first and second surfaces which reflect the respective portion in a diffused fashion as a reflected beam; sensing each reflected beam from a scattering point on the surface of the workpiece as the reflected beam assumes the given path; measuring the time lapse from the initial position of each portion until the reflected beam is sensed; converting each of the time lapses into a deflection angle γ; calculating the distance d_i of each scattering point from the reference plane according to

$$d_i = A_i \frac{\sin \gamma_i}{\sin(\alpha + \beta \pm \gamma_i)} \cdot \frac{\cos \beta}{\cos \alpha}$$

where $i = 1,2,3$ and 4,
wherein γ_i is the angle between the initial position and the position when a reflected beam of the given path is detected for the portion i, A_i is the distance between the reference plane and the reflector i, γ_i being positive when the angle of incidence of the portion increases and being negative when the angle decreases; and subsequently calculating the thickness d of the workpiece according to

$$d = \frac{\dfrac{(d_1 d_3)(d_1+d_2)+(d_1+d_3)}{(d_2-d_1)+(d_1-d_4)(d_1+d_2)+(d_1+d_4)(d_2-d_1)}}{2\sqrt{(d_1+d_2)^2+(d_2-d_1)^2}}$$

so that a thickness of a workpiece, which is tilted in relation to the reference plane about two perpendicular axes which are parallel to the reference plane, can be determined.

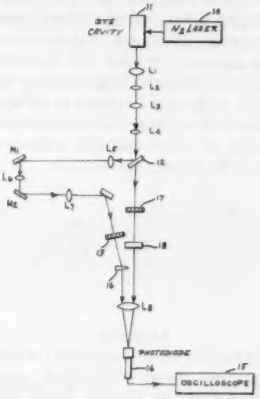
4,068,956

PULSED LASER DENSITOMETER SYSTEM

John Taboada, 159 Ebbtide, San Antonio, Tex. 78227

Filed Apr. 16, 1976, Ser. No. 677,588
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—205 **2 Claims**

1. A pulsed densitometer system for measuring a sample comprised of a pump laser of the TEA N_2 type, a dye cavity pumped by said pump laser to provide an output beam of pulses, the pulse duration of said dye cavity being of the order of 5–10 ns, a cylindrical lens for correcting the sssymetry of the output beam from said dye cavity, a combination of a focal length relay lens and a collimating telescope for further correcting the bam from said cylindrical lens, a beam splitter to separate the beam from said combination into a probe beam and a reference beam, means to delay said reference beam to provide temporal separation of said probe and reference beam, said delay means having a predetermined length x, x being equal to 3 ct with c being the speed of light propagation in the delay means and t being the pulse duration time, said delay means consisting of first, second and third mirrors in sequence and first, second and third lenses, each of said lenses with several meters of focal lengths to control the beam divergence, said first lens positioned between said beam splitter and said first mirror, said second lens between said first and second mirrors, said third lens between said second and third mirrors, an attenuation reference filter receiving the reference beam from said delay means for reduction to a minimum detectable



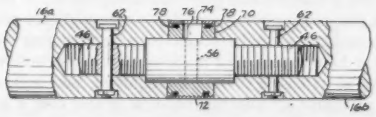
level, a sample to be measured for density, said probe beam from said beam splitter passing therethrough, a focusing lens receiving the probe beam from said sample, a wedge receiving the reference beam from said attentuation reference filter to co-align said reference beam with said probe beam on said focusing lens, a high speed photodiode detector receiving the co-aligned probe and reference beam from said focusing lens in a small area thereupon of about 1 mm^2 to inhibit small gain variations from different parts of the detectors surface, an oscilloscope receiving the output from said high speed photodiode detector to provide the optical density information of said sample in the ratio of the pulse amplitude of the probe beam to the reference beam.

4,068,957

TRANSFER BAR COUPLING

John H. Brems, Birmingham; John Kobane, Jr., Livonia, both of Mich., and Wilfred J. Zetner, LaSalle, Canada, assignors to F. Jos. Lamb Company, Warren, Mich.

Filed Aug. 23, 1976, Ser. No. 716,832
Int. Cl.[2] F16D *1/00*
U.S. Cl. 403—8 **6 Claims**



1. In a machine for transferring workpieces progressively through a series of stations, a cylindrical transfer bar comprising a plurality of linearly successive sections coupled together at their adjacent ends, the adjacent end faces of said sections being in abutting relation with the opposite end faces of a tubular spacer positioned therebetween, the adjacent end portions of each of said sections having a threaded bore therein

concentric with the longitudinal axes of said sections, the threads of said bores being of opposite hand, a double-ended screw in threaded engagement with said threaded bores so that when the screw is rotated in opposite directions the transfer bar sections are displaced axially toward and away from each other, said spacer and screw having radially registering openings therein for the reception of a tool for turning said screw to compress the spacer between the ends of adjacent transfer bar sections, said holes being shaped to permit final tightening of the screw while the spacer remains fixedly clamped between the ends of the transfer bar sections, means for locking said screw and transfer bar sections against relative rotation for retaining said spacer in said compressed condition, the outer diameter of said spacer being less than the outer diameter of the transfer bar sections and including a tubular shield circumferentially circumscribing the spacer, said shield having a radial opening therein adapted to register with the radial opening in said spacer, said shield having a length smaller than the spacer to permit rotation of the shield relative to the spacer to locate the opening therein in a preselected circumferential position, said shield having an outer diameter corresponding to the outer diameter of the transfer bar sections.

4,068,958

DIFFERENTIALLY BOLTED JOINT

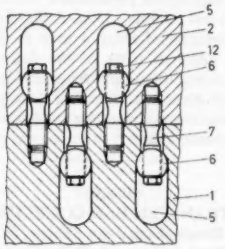
Wolfgang Beckershoff, Aarau, Switzerland, assignor to BBC, Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jan. 28, 1977, Ser. No. 763,320

Claims priority, application Switzerland, Apr. 6, 1976, 4281/76

Int. Cl.[2] F16B *5/02*

U.S. Cl. 403—8 **11 Claims**



1. A differentially threaded bolting arrangement for securing two machine parts together comprising at least one threaded bolt, the opposite end portions of said bolt being provided respectively with threads differing in pitch, a threaded hole in a first one of said machine parts into which the end of said bolt having the greater pitch is threadable, a throughbore provided in a second one of said machine parts in alignment with the threaded hole in said first machine part and a hollow area forming an extension of said throughbore, said hollow area being accessible for effecting rotation of said bolt, a nut disposed in said hollow area, said nut being movable axially into contact with an end face of said hollow area but restrained against rotation about its axis by engagement with lateral faces of said hollow area, and the opposite end of said bolt having the smaller pitch being threadable into said nut whereby said nut is moved axially upon rotation of said bolt into contact with said end face of said hollow area accompanied by a drawing together of said first and second machine parts.

4,068,959

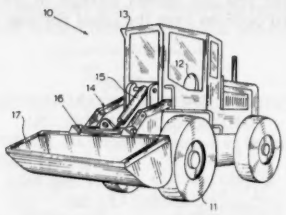
COUPLER APPARATUS

Bruce W. Pemberton, No. 314, Lake Howell Arms Apartments, Casselberry, Fla. 32707

Filed Nov. 26, 1976, Ser. No. 745,063

Int. Cl.[2] F16D *1/00*; F16L *17/00, 29/00*

U.S. Cl. 403—15 **10 Claims**



1. A coupling mechanism for front end loaders and the like, comprising in combination:

vehicle attaching portion having a frame, and a pair of fixed attachment engaging members said frame having two side frame members, each having at least one slot therein connected together by a transverse member and being movably connected to said frame;

a pair of movable locking members movably connected to said frame, each movable locking member extending through a slot in one side frame member for sliding therein;

a fluid cylinder connected between said frame and said movable locking members for moving said movable locking members from a first unlocked position to a second locked position;

attachment connecting portion, having a pair of upper brackets connectable to an attachment for a vehicle, and shaped to receive said fixed attachment engaging members of said vehicle attachable portion;

a pair of lower brackets connectable to an attachment for a vehicle and shaped to receive said movable locking members for locking said attachment to said vehicle upon actuation of said movable locking members when said attachment is supported by said fixed, attachment engaging members in said upper brackets;

at least one guide member connected to said movable locking member transverse member; and

at least one track attached to said frame and positioned to guide one said guide member for guiding the movement of said movable locking members in said slots in said side frame members.

4,068,960

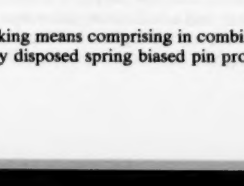
SAFETY LOCK FOR A REMOVABLE SHAFT

William E. Swager, P.O. Box 656, Fremont, Ind. 46737

Filed Sept. 17, 1976, Ser. No. 724,264

Int. Cl.[2] B25G *3/00*

U.S. Cl. 403—20 **7 Claims**



1. A shaft locking means comprising in combination, a shaft having an axially disposed spring biased pin projecting there-

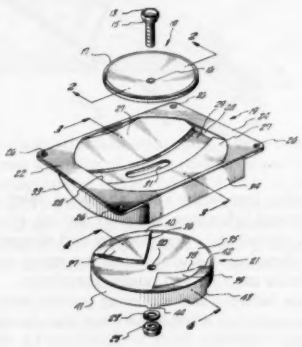
from, a rim disposed along the edge of the shaft about the spring biased pin, a shaft support member having means to receive the shaft, and a slidable rim engaging member having a slot therein for receiving the spring biased pin, said slidable rim engaging member being disposed within the body portion of the support member.

4,068,961

SWIVEL JOINT

John Steven Ebner, Boca Raton; Francis Charles Pizzeri, Miami Shores, and Charles Grimes Sprecher, III, Pembroke Pines, all of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Filed Aug. 23, 1976, Ser. No. 716,379
Int. Cl.[2] F16B *7/10*
U.S. Cl. 403—55 **10 Claims**



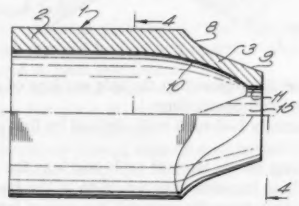
1. A swivel joint for permitting limited movement in two orthogonal planes, comprising:
- a swivel top having a recess therein, said recess having a surface of curvature defined by a first radius, an oblong aperture located adjacent said surface of curvature, its longer axis lying in a first orthogonal plane;
- a swivel bottom, having a surface of curvature defined by a second radius, two riser segments on the second radius surface of curvature, and an aperture in said second radius surface of curvature; and
- means for holding said swivel top and swivel bottom together in a nested slidable relationship.

4,068,962

CABLE OR ROPE CLAMP

Cedric Gwilliam Birks, Leeds, England, assignor to CCL Systems Limited, Surbiton, England

Filed June 2, 1976, Ser. No. 692,142
Claims priority, application United Kingdom, June 10, 1975, 24807/75
Int. Cl.[2] F16G *11/02*
U.S. Cl. 403—212 **5 Claims**



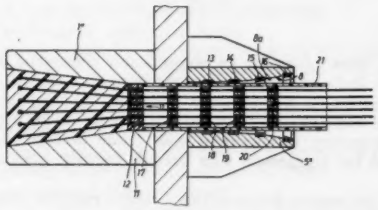
1. A cable or rope clamp, comprising a metal sleeve or ferrule having a body portion of substantially oval cross-section and an end portion of substantially frusto-conical formation, said ferrule having a central longitudinal axis, said body portion, when viewed in transverse cross-section, having a long axis and a short axis extending lengthwise thereof, wherein the wall of said end portion, when viewed in longitudinal section along a longitudinal plane including said long axis, has an outer surface comprising a short concave part having a sharp junction with said body portion and leading directly into a long straight part inclined towards said central longitudinal axis of said ferrule.

4,068,963

MEANS ANCHORING A BUNDLE OF WIRES IN A SOCKET

Antonio Brandestini, Kusnacht, Switzerland, assignor to Bureau BBR Ltd., Zurich, Switzerland

Filed Jan. 27, 1977, Ser. No. 763,093
Claims priority, application Switzerland, Feb. 9, 1976, 1546/76
Int. Cl.[2] B25G *3/34*
U.S. Cl. 403—268 **20 Claims**



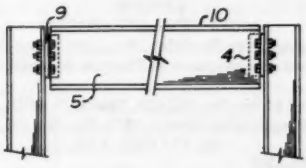
1. An anchoring arrangement for anchoring a bundle of wires in an anchoring head, comprising:
- an anchoring head through which extends the bundle of wires;
- said bundle of wires departing from the anchoring head at an exit side theeof;
- a support body provided at the exit side of said anchoring head and through which extend said bundle of wires;
- said support body having a support surface equipped with friction-reducing means;
- said support surface, viewed in longitudinal sectional view, outwardly widening in a substantially curved-shaped configuration.

4,068,964

END PLATE CONNECTION UNIT FOR BEAMS

Robert J. Stoker, 951 Thistle Place, Warren, Ohio 44480

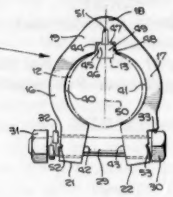
Filed Feb. 9, 1977, Ser. No. 767,129
Int. Cl.[2] B25G *3/34*
U.S. Cl. 403—272 **6 Claims**



1. An end plate shear connection for bolting a steel beam or the like to a structural shape, comprising a connection plate unit of T section with the head of the T perpendicular to the stem of the T, said unit adapted to be fixed to the web of a beam with the head in a vertical plane perpendicular to a vertical plane through the center line of the web, the head facing one end of the web and having bolt holes on opposite sides of the center line of the web for bolting the head to a structural shape, the stem of the T lying against the web and adapted to be

secured to the web by a weld penetrating the head and the adjacent portions of the stem and said one end of the web for fastening the web to the head and stem.

4,068,965
SHAFT COUPLING
Robert D. Lichti, Lakewood, Calif., assignor to CraneVeyor Corporation, South El Monte, Calif.
Filed Nov. 8, 1976, Ser. No. 739,468
Int. Cl.[2] F16D *1/04*
U.S. Cl. 403—313 **7 Claims**



1. A unitary coupling for non-rotatably connecting axially aligned shafts which have keyways in axial alignment and a key member for said keyways, said coupling comprising an integral single piece body of resilient material having opposite complementary half sections with inside arcuate surfaces adapted for engagement with laterally opposite sides of the shafts,

said half sections having adjacent captive ends and a hinge of said material joining said ends,

portions of said captive ends having a slot therebetween adjacent said hinge,

each of said captive ends having surfaces forming a corner with a space between said surfaces and said spaces together forming a keyway adjacent said slot,

complementary flanges on respective free ends of said half sections including fastening means,

said half sections having an initial relationship extending at an acute angle outwardly relative to each other from the hinge wherein portions of said arcuate surfaces are spaced at progressively varying distances from the respective sides of the shaft and portions of said surfaces at the corner are spaced at progressively varying distances from said key member to enable the body to be placed over and clear of the shafts before clamping,

said half sections being adapted to be drawn toward each other and toward said key member and the shaft progressively from the captive ends to the free ends by use of said fastening means whereby the arcuate surfaces engage the shafts and the surfaces at the corners engage the key member.

4,068,966
MOUNTING APPARATUS
Ben C. Johnson, New Braunfels, Tex., and Pieter Band, Blackburn, Australia, assignors to Thermon Manufacturing Company
Continuation of Ser. No. 562,024, March 26, 1975, abandoned.
This application June 1, 1976, Ser. No. 691,244
Int. Cl.[2] F16L *3/08*
U.S. Cl. 403—397 **6 Claims**

1. A mounting apparatus for releasably securing an external member to a tubular member comprising;

an elongate tubular member;

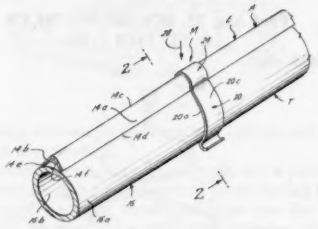
an elongate external member adapted to be releasably secured to and in engagement with said tubular member;

a clamping member having:

a resilient arcuate mounting portion adapted to engage said elongate external member having spaced apart, symmetrically formed mounting portion ends, the distance between said mounting portion ends being no less than the distance between any two points on said mounting portion forming a line parallel to a line joining said mounting portion ends; and,

two resilient, symmetrically formed curved clamping legs joining said mounting portion at said mounting portion ends wherein said mounting portion ends merge into and form an intergral part with said clamping legs;

said curved clamping legs positioned opposite each other and spaced apart a distance less than the diameter of said elongate tubular member prior to mounting said curved clamping legs for resiliently engaging said elongate tubular member;

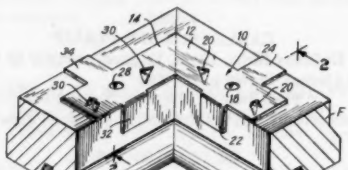


said clamping legs terminating at spaced apart, symmetrically formed, clamping leg ends having symmetrically formed, curved end projections on said clamping leg ends of said clamping legs to facilitate mounting on said elongate tubular member and release therefrom;

the distance between said mounting portion ends being less than the maximum distance between said curved clamping legs; and,

said mounting portion releasably securing said elongate external member to said elongate tubular member along the length of said external member and said tubular member with said elongate external member in longitudinal engagement with said elongate tubular member.

4,068,967
CORNER BRACKET FOR FRAMES
Marvin Hoodis, 14 Riviera Drive, Smithtown, N.Y. 11787
Filed Oct. 27, 1976, Ser. No. 735,999
Int. Cl.[2] B25G *3/36*
U.S. Cl. 403—402 **15 Claims**



1. A bracket for connecting the side sections of an annular frame, said bracket comprising:

a. a substantially L-shaped body defined by first and second legs;

b. connecting means integral with said legs for permitting said body to be secured to a portion of the frame; and

c. at least two spacedly opposed tab means integral with each said leg along opposite side edges thereof, at least a portion of one of said tab means integral with each said leg being in planes that are perpendicular to each other and parallel to the side edges of said legs with the other of said tab means integral with each said leg being co-planar with

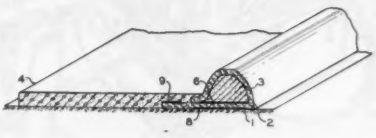
said respective leg whereby said portions of said one tab means are adapted to retentively engage the side sections of the frame on the inside or outside surface thereof.

4,068,968

ROADWAY BARRIER STRUCTURE AND METHOD OF MAKING

Duane W. Gagle, and Homer L. Draper, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 16, 1976, Ser. No. 706,030
Int. Cl.[2] E01C *11/22*
U.S. Cl. 404—7 **25 Claims**



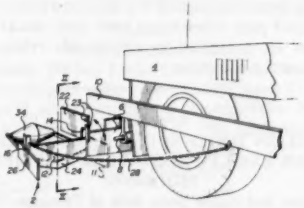
1. A roadway structure comprising a base course, a porous fabric at least a portion of which rests upon said base course, a traffic-bearing course resting upon at least a portion of the portion of said porous fabric which rests upon said base course, a barrier structure resting upon and bonded to at least a portion of the portion of said porous fabric which rests upon said base course and extends beyond said traffic-bearing course.

4,068,969

GUTTER ATTACHMENT FOR ASPHALT SPREADER

Roy Beach, and Ivan Beach, both of 1708 - 6th Avenue East, Owen Sound, Ontario, Canada

Filed May 27, 1977, Ser. No. 801,041
Int. Cl.[2] E01C *11/28*
U.S. Cl. 404—98 **12 Claims**



1. An attachment for one side of an asphalt paving machine, the paving machine having draw arms, a screw auger and a screed, to permit the laying of a gutter adjacent to and integral with a roadway surface being simultaneously laid, the attachment comprising:

a. a flat extension plate for vertical orientation, the plate having top and bottom and opposite sides, and supports secured to each side thereof;

b. means associated with one of the supports to releasably secure the plate in vertical orientation parallel to and aligned with the screed;

c. a rearwardly curved base secured to and extending from side to side along the bottom of the extension plate to conform to the desired cross-sectional profile shape of the gutter, the bottom of the portion of the base nearest the screed, when the attachment is secured in position to the machine, being more or less flush with the bottom of the screed;

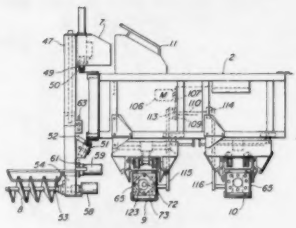
d. an end gate secured to the outer support to ensure proper width and edging of asphalt gutter.

4,068,970

CONCRETE FINISHING MACHINES

Murray A. Rowe, Canton, S. Dak., assignor to CMI Corporation, Oklahoma City, Okla.

Filed May 3, 1976, Ser. No. 682,522
Int. Cl.[2] E01C *19/22*
U.S. Cl. 404—120 **9 Claims**



1. A concrete finishing machine comprising

a. an elongated supporting frame,

b. means mounted on said frame for moving said frame along a highway in a direction transverse to the length of said frame,

c. supporting means mounted on said frame for movement longitudinally thereof,

d. means mounted on said frame for reciprocating said supporting means longitudinally of said frame,

e. an elongated conveyor screw

1. mounted on and carried by said supporting means for movement therewith longitudinally of said frame in a direction transverse to the length of said screw, and

2. projecting generally horizontally from one longitudinal side of said frame for moving concrete away from said one side upon rotation of said screw,

f. means mounted on said supporting means for rotating said screw,

g. an elongated screed,

h. means mounting said screed on said frame in substantially directly underlying parallel relation thereto in position to engage concrete underlying said frame,

i. means on said supporting frame for longitudinally reciprocating said screed, and

j. means on said screed for vertically vibrating the latter,

k. said means mounted said screed comprising

1. two pairs of substantially horizontally extending parallel tracks mounted on respective end portions of said screed and disposed thereabove in substantially parallel relation to said screed,

2. two pairs of rollers,

3. each of rollers supportingly underlying a respective end of said tracks,

4. abutment means projecting outwardly from opposite lateral sides of each of said end portions of said screed, and

5. two pairs or other rollers mounted on and supported by said frame in depending relation thereto,

6. each of said rollers being operatively engaged with the upper surface of a respective one of said abutment means in position to hold said tracks down against said first mentioned rollers.

4,068,971

UNIVERSAL COIL CARRIER

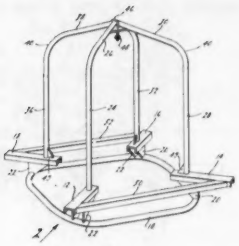
Walter W. McNeill, Toronto, Canada, assignor to Bundy Corporation, Detroit, Mich.

Filed Mar. 16, 1976, Ser. No. 667,291
Int. Cl.[2] B65H *75/20*
U.S. Cl. 294—67 R **14 Claims**

1. A coil carrier comprising:

a. a base having a central opening;

b. a coil receiving portion disposed above said base, said coil receiving portion having a lower generally vertical portion adapted to have coils of tubing or the like wrapped therearound and being of a size and shape to fit within the central opening of another similar carrier when the latter is disposed thereabove in nested relationship, and an upper generally horizontal portion; and



c. support means positioned on said carrier and extending radially inwardly to a position overlying said central opening, said support means being adapted to rest upon said upper portion of the coil receiving portion of another similar carrier when stacked on the latter.

4,068,972

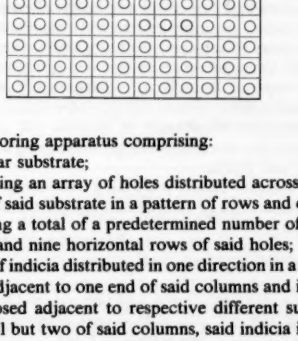
GOLF PEG SCORE CARD

Clifford C. Stuart, 1505 Village Ave., Loveland, Colo. 80537

Filed Jan. 5, 1976, Ser. No. 635,978

Int. Cl.[2] G09B *19/22*; G08B *5/00*

U.S. Cl. 283—49 **1 Claim**



1. A golf scoring apparatus comprising:

a rigid planar substrate;

means defining an array of holes distributed across a major surface of said substrate in a pattern of rows and columns, there being a total of a predetermined number of vertical columns and nine horizontal rows of said holes;

a plurality of indicia distributed in one direction in a horizontal row adjacent to one end of said columns and individually disposed adjacent to respective different successive ones of all but two of said columns, said indicia individually representing successively different respective numbers in a series of numbers in order from the number "one" through a number that is two less than the total number of said columns;

a plurality of eighteen pegs manually securable removably in said holes, each individual different one of said pegs being marked to indicate a respective different one of the numerals from "one" through "eighteen", and said pegs being securable in said holes in selectively different relative orientations with respect to the orientation of the marking to indicate said numerals.

4,068,973

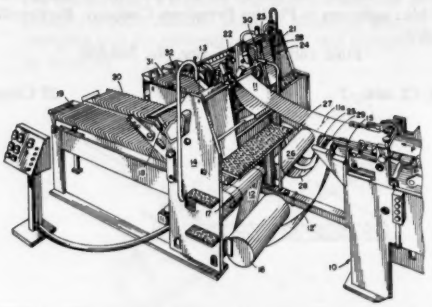
METHOD FOR MANUFACTURE OF BUSINESS FORMS

James B. Fulk, Saratoga, Calif., assignor to Paper Converting Machine Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 606,647, Aug. 21, 1975, abandoned. This application June 28, 1976, Ser. No. 700,138

Int. Cl.[2] B65H *41/00*

U.S. Cl. 270—52.5 **5 Claims**



1. In a method for manufacture of business forms, the steps of advancing at least three superposed webs along a generally horizontal processing path wherein said webs are simultaneously and continuously processed, said processing including at least across perforation, advancing only one of said webs further in said path to a two-wide folder and zig-zag folding said one web, moving one of the remaining webs laterally of said path to a second path parallel to the first mentioned path and introducing the same into said two-wide folder and zig-zag folding the same, moving the other of said remaining webs a distance laterally of the first mentioned path substantially further than the distance said one of the remaining webs was moved laterally into a third path parallel with said first mentioned path and then folding said other of said remaining webs in a second folder separate from said two wide folder, said folders being generally aligned in a direction transverse of said first mentioned path whereby at least three stacks of zig-zag folded webs are presented in side-by-side relation along a common front for takeaway.

4,068,974

FOUNTAIN TOOTHBRUSH HAVING BRISTLE CARRIER EASILY PRODUCIBLE BY INJECTION MOLDING

Walter Meyer, and Anton Bara, both of Triengen, Switzerland, assignors to Trisa Burstenfabrik AG Triengen, Triengen, Switzerland

Filed July 13, 1976, Ser. No. 704,939

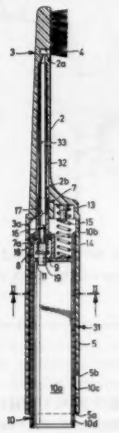
Claims priority, application Switzerland, June 8, 1976, 7184/76

Int. Cl.[2] A46B *11/00*

U.S. Cl. 401—150 **6 Claims**

1. A fountain toothbrush comprising a bristle carrier, a set of bristles on said carrier near one end thereof, a rigid handle containing a reservoir for liquid or pasty dentifrice, a duct leading form the reservoir through the bristle carrier to the set of bristles, actuating means facing toward the reservoir and comprising a spring member which urges the reservoir in a direction out of the handle, and a piston which is borne by the bristle carrier at its end facing away from the bristles, and being firmly connected thereto, and which has a passage being connected to said duct and to the interior of said reservoir; and a cylinder sleeve part being provided on said reservoir into which said piston protrudes, being displaceable and sealingly guided in said sleeve part in unactuated, or in an actuated position, whereby, when the piston is pushed into the sleeve part in the direction towards the reservoir, dentifrice is con-

veyed through said piston passage and said duct onto the bristles, and wherein the reservoir is inserted axially displaceably into the handle so that it protrudes with its outer end out of the handle, the latter being open at its end away from the bristle carrier, and wherein the reservoir can be displaced into the handle for conveying dentifrice onto the bristles, said reservoir having an opening connecting the interior of the reservoir with the interior of said sleeve part, and wherein said



piston carries, at its end facing toward said reservoir, a sealing element being permanently in sealing engagement with the inner wall of said sleeve part; said piston further comprising, housed in the passage therethrough, a valve body which is displaceable relative to the piston and containing means for obturating said opening toward the end of each stroke of the piston into said sleeve part, and freeing said opening again when the piston and the sleeve part are displaced away from one another.

4,068,975

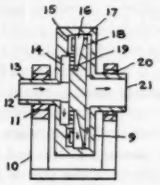
FLUID PRESSURIZER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 568,895, April 17, 1975, Pat. No. 4,003,673, and a continuation-in-part of Ser. No. 636,310, Nov. 18, 1975, Pat. No. 4,012,164. This application Dec. 27, 1976, Ser. No. 754,734

Int. Cl.² F01D *1/18*

U.S. Cl. 415—80 **2 Claims**



1. A fluid pressurizer comprising:

a. a shaft mounted for rotation;

b. a rotor mounted on said shaft to rotate therewith, said rotor being provided with an entry for a fluid to be pressurized, said entry communicating with a pressurizing cavity extending outwardly from the rotor center, said pressurizing cavity communicating with a set of feeder nozzles for passing a fluid forwardly in the direction of rotation into a free vortex cavity of circular configuration and transverse to the rotor axis, said free vortex cavity communicating near its periphery with exit openings to allow the discharge of the fluid from the free vortex cavity.

4,068,976

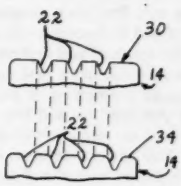
CUTTING INSERT CONFIGURATION

Ernest J. Friedline, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed June 29, 1976, Ser. No. 700,877

Int. Cl.² B26D *1/00*

U.S. Cl. 407—114 **5 Claims**



1. An even sided polygonal cutting insert formed of a hard wear resistant material and comprising a body having substantially parallel polygonal faces connected by a peripheral wall which forms cutting edges at the juncture thereof with at least one of said faces, the peripheral wall having notches formed therein extending transversely to said faces and interrupting the cutting edge in regions uniformly spaced therealong and having n notches interrupting a pair of cutting edges on one face and n plus m notches interrupting another pair of cutting edges on said one face, the notches interrupting said pair of cutting edges on said one face being staggered relative to the notches interrupting said another pair when said edges are viewed in superposed relation.

4,068,977

TAPPING HEAD

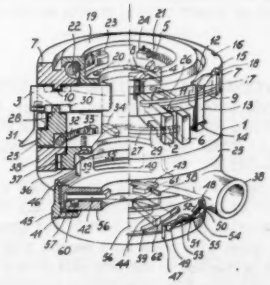
Attilio Rossetti, Via Verdi, 2, San Benedetto Po (Mantova), Italy

Filed July 22, 1976, Ser. No. 707,784

Claims priority, application Italy, July 28, 1975, 18109/75

Int. Cl.² B23G *1/52, 5/12*

U.S. Cl. 408—177 **1 Claim**



1. A tapping head having at least two groups of indexable chasers of different pitches, arranged over a circumferential array and radially extending thereto, comprising a block in the form of a hollow cylinder block, radial grooves in said cylinder block for slidably receiving therein said chasers, the chasers of a first of said groups having each a groove on a side thereof facing one end of said cylinder block and the chasers of a second of said groups having each a second groove on an opposite side thereof facing a first ring nut coaxially arranged

near said one end of said hollow cylinder block and circumferentially slidable therein, said first ring nut having cam means in the form of an arcuated rib projecting from a surface thereof facing said side of the chasers of said first group thereof and engaging said grooves thereof to radially shift said first group chasers during rotation of said first ring nut, said first ring nut having transverse indexing notches on an outside peripheral surface thereof for positioning said first ring nut in operative positions thereof defined by said notches and first locking means on said cylinder block, for locking said first ring nut in a selected operative position, said first locking means comprising a first click member hinged on said cylinder block and first spring means urging said first click member in selective engagement with one of said first notches when the selected first notch is brought in the reach of said first click member during indexing of said first ring nut and a first threaded adjustment dowel for exact angular positioning of said first ring nut, a shaped cover ring superposed on said first ring nut independently thereof and fixed on said cylinder block, said shaped cover ring and said first ring nut defining an arcuated cavity therebetween, spring means within said arcuated cavity and having one end thereof rigid with said first ring nut an another end thereof rigid with said cover ring to urge said first ring nut in a rest position thereof, a second ring nut concentric with said hollow cylinder block and arranged slidably thereon remote from said first ring nut, said second ring nut having second cam means in the form of an arcuated rib projecting from a surface thereof facing said opposite side of the second group chasers and engaging said second grooves thereof to radially shift said second group chasers during rotation of said second ring nut, said second ring nut having second transverse indexing notches on an outside peripheral surface thereof for positioning said second ring nut in operative position thereof defined by said second notches and second locking means on said cylinder block remote from said first locking means for locking said second ring nut in a selected operative position thereof, said second locking means comprising a second spring biased click member hinged on said cylinder block and urged in selective engagement with one of said second notches when the selected second notch is brought in the reach of said second click member during indexing of said second ring nut, a circumferential recess at the inside periphery of said second ring nut member, a second spring means within said circumferential cavity and having one end thereof rigid with said second ring nut and the other end thereof rigid with said hollow cylinder block to urge said second ring nut member in a rest position thereof, self centering guide and support devices for the pipe to be worked while cutting the thread therein and devices for rotating the cylinder block to impart cutting motion to the chasers.

4,068,978

ASSOCIATING DRILL CHUCK KEYS WITH DRILL

J. Farny Brock, 11531 Samoline Ave., Downey, Calif. 90241

Filed Aug. 20, 1976, Ser. No. 716,116

Int. Cl.[2] B23B *39/00;* **B25B** *13/44;* **B23Q** *11/00*

U.S. Cl. 408—241 R **10 Claims**

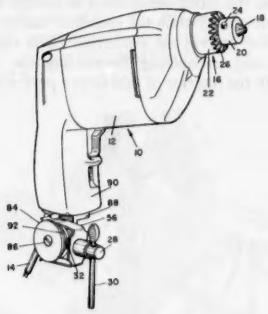
1. For an electric drill of the kind having a chuck whose relatively moving parts are rotatable by a key, the key including a pin insertable into a first part of the chuck and a gear whose teeth mesh with teeth on a second part of said chuck when the pin is inserted to the first part of said chuck;

an improved key and key attachment assembly comprising a key having a shank ending at one end in a pin and a gear;

fastening means for clamping the key to said first part of a drill chuck with its pin in the first part of the chuck and with its teeth in mesh with the teeth of the chuck while permitting simultaneously rotation of the key and said second part of the chuck;

said clamping means comprising a pair of spaced resilient arms extending in like direction on opposite sides of said pin and gear;

said arms being biased toward one another to a position in which their spacing is less than the dimension across said first part of the chuck; and



securing means for securing said arms to the key while permitting rotation of the gear relative to said arms.

4,068,979

MARINE PROPULSIVE DEVICE

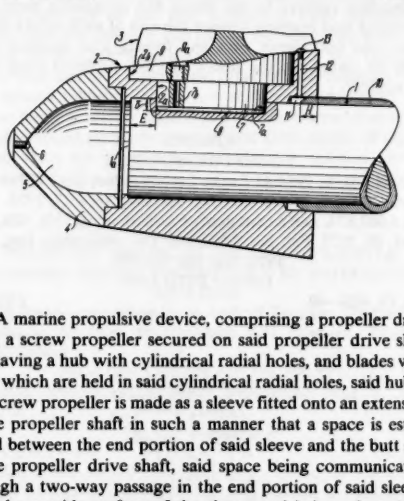
Nikolai Sergeevich Vysokorodov, prospekt Stachek, 75, kv. 169, Leningrad, U.S.S.R.

Filed Sept. 22, 1975, Ser. No. 615,204

Claims priority, application U.S.S.R., July 26, 1973, 1950482

Int. Cl.[2] B63H *1/26*

U.S. Cl. 416—207 **2 Claims**



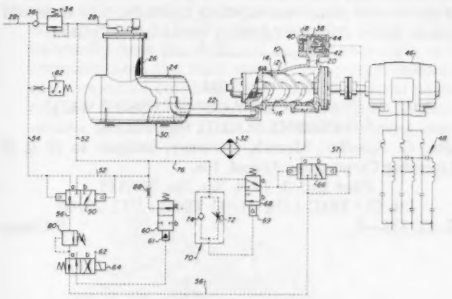
1. A marine propulsive device, comprising a propeller drive shaft; a screw propeller secured on said propeller drive shaft and having a hub with cylindrical radial holes, and blades with roots which are held in said cylindrical radial holes, said hub of said screw propeller is made as a sleeve fitted onto an extension of the propeller shaft in such a manner that a space is established between the end portion of said sleeve and the butt end of the propeller drive shaft, said space being communicated, through a two-way passage in the end portion of said sleeve, with the outside surface of the sleeve and being adapted for feeding a liquid under pressure directly into said space in the course of hub dismantling, each of said cylindrical radial holes in the hub of said screw propeller being open-ended, and sockets coaxial with said cylindrical radial holes are provided in the propeller drive shaft for receiving and holding the end of the propeller blade roots, wherein said propeller drive shaft includes a bushing, a cylindrical boring coaxial with the propeller drive shaft is made in the propeller hub end facing said bushing; said hub is adapted to fit onto said bushing so as to define an annular space therebetween, said annular space communicating with the outside surface of said hub through a two-way passage provided in said hub.

4,068,980

COMPRESSOR STARTUP CONTROL

Gary J. Fine; Michael G. Herschler, and John C. Shoop, all of Quincy, Ill., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Oct. 1, 1976, Ser. No. 728,703
Int. Cl.[2] F04B 49/02
U.S. Cl. 417—282 7 Claims



1. In a control system for a gas compressor including a positive displacement gas compressor, a motor drivably connected to said compressor, an inlet throttling valve operable to be open to admit inlet gas to said compressor upon commencement of starting of said compressor and including a pressure fluid actuator for closing said throttling valve, compressed gas receiver means connected to said compressor, a compressed gas service conduit connected to said receiver means for conducting compressed gas from said receiver means, and a check valve interposed in said service conduit and operable to prevent the back flow of compressed gas from said service conduit to said receiver means, the improvement characterized by:

first conduit means in communication with said receiver means for conducting a pressure fluid signal to said actuator to close said throttling valve in response to increasing pressure in said receiver means upon starting said compressor;

a normally open control valve interposed in said first conduit means, said control valve being pressure fluid actuated to interrupt said pressure fluid signal to said throttling valve,

a pressure fluid timer in communication with said first conduit means for receiving a pressure fluid signal therefrom and for actuating said control valve to interrupt said pressure fluid signal to said actuator at the expiration of a predetermined time period to allow said throttling valve to reopen;

second conduit means in communication with said service conduit downstream of said check valve in regard to the normal flow of compressed gas; and,

a first shuttle valve connected to said first conduit means and said second conduit means and responsive to the greater of the pressure signals in said respective conduit means to conduct said greater pressure signal to said actuator for closing said inlet throttling valve.

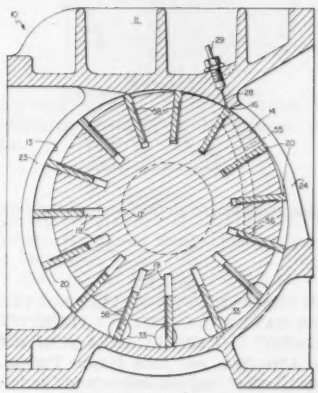
4,068,981

BLADE-TYPE ROTARY COMPRESSOR WITH FULL UNLOADING AND OIL SEALED INTERFACES

Zoltan A. Mandy, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed July 13, 1976, Ser. No. 704,886
Int. Cl.[2] F04B 49/02; F01C 21/04; F04C 27/00, 29/02
U.S. Cl. 417—310 2 Claims

1. In a rotary compressor having a body with a cylindrical bore, end caps at opposite ends of said body, a rotor eccentrically mounted within said bore, said rotor substantially engaging said bore along a seal line, means for driving said rotor, said rotor having a plurality of radial grooves extending the entire length, a blade slidably mounted in each groove, said blades cooperating with said bore, said end caps and said rotor to define a plurality of compression pockets, said body having a fluid inlet opening on one side for introducing fluid to be compressed into said compression pockets and a discharge opening remote from said inlet opening for discharging compressed fluid from said body, means for driving said rotor in a direction from said inlet opening toward said discharge opening, the area between said inlet and discharge openings in the direction of rotation of said rotor defining the compression side of said compressor, the improvement comprising, each of said



end caps having an elongated arcuate channel extending throughout its length adjacent to the discharge opening of said body, and means for introducing oil under pressure greater than the pressure created within the compression pockets into an inlet end of said channel, said inlet end of said channel being located at the beginning of the discharge opening outwardly of the inner side edge surfaces of the blades and spaced inwardly from the periphery of said rotor, said channel curving outwardly along the discharge opening and terminating adjacent to the periphery of said rotor substantially at said seal line adjacent the end of the discharge opening.

4,068,982

CHARGE CONTROL VALVE AND PISTON ASSEMBLY FOR DIAPHRAGM PUMP

Vernon K. Quarve, Minneapolis, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Dec. 20, 1976, Ser. No. 752,419
Int. Cl.[2] F04B 9/10, 35/02
U.S. Cl. 417—387 10 Claims

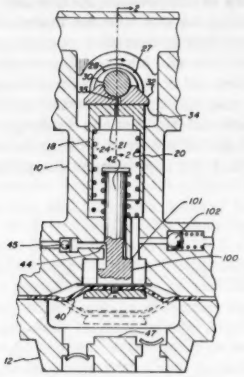
1. In a diaphragm pump of the type having a reciprocating piston for alternately pressurizing and relieving an oil-filled chamber having a diaphragm separating said chamber from a liquid pumping chamber, the improvement in piston reciprocating drive and oil volume control, comprising:

a. a rotatable crankshaft with an axially offset cam;

b. a bearing shoe fitted on said cam and having a bearing surface for contacting said piston, said bearing shoe having an oil groove along its surface fitted on said cam and having an oil port between said groove and said piston bearing surface; and

c. a piston oil port passing through said piston and opening

to said piston surface contacting said bearing surface, whereby said piston oil port and said bearing shoe oil port



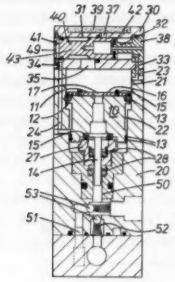
come into coincidence during each piston reciprocating stroke.

4,068,983

PISTON PUMPS DRIVEN BY FLUID-ACTUATED PISTON HAVING A CONSTANT FLUID FORCE AGINST THE SMALL AREA SURFACE

Roy Balme, Altrincham, and John Francis Perkins, Newton, near Walsall, both of England, assignors to Charles S. Madan & Company Limited, Altrincham, England

Filed July 28, 1975, Ser. No. 599,405
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—401 **7 Claims**



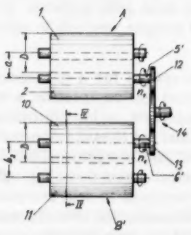
1. A reciprocating pump for liquids comprising a body, a piston slideably disposed within said body and having a large area face and a small area face, a shuttle valve casing associated with said pump body and having a motive air inlet and a motive air exhaust, a valve shuttle operable with respect to said motive air inlet and motive air exhaust having a large area face and a small area face disposed in said casing between said motive air inlet and motive air exhaust, and the large area face of said piston, said valve shuttle being slideable in said casing between a first position wherein it occludes said motive air inlet and a second position wherein said motive air inlet communicates with the large area face of said piston, signal air inlet means provided in said pump body and opening on the small area face of said piston, said signal air inlet means being positioned to continuously maintain signal air pressure on said small area face for all portions of said piston and at the same pressure as said motive air, first conduit means provided in said pump body and shuttle valve casing between said signal air inlet and the large area face of said shuttle valve for signal air flow to drive said valve shuttle into said first position, second conduit means provided in said pump body and shuttle valve casing between said signal air inlet and the small area face of said valve shuttle for signal air flow to drive said valve shuttle into said second position whereby said piston is driven in a pumping stroke by the pressure of said motive air against the large area face of said piston, hydraulic fluid receiving chamber means provided within said pump body and defining an inlet and outlet, and a pump ram for relative reciprocal movement within said chamber means responsive to movement of said piston, said pump ram expelling hydraulic fluid from said chamber means during a pumping stroke of said piston.

4,068,984

MULTI-STAGE SCREW-COMPRESSOR WITH DIFFERENT TOOTH PROFILES

Walter G. Spindler, Munich, Germany, assignor to H & H Licensing Corporation, Miami, Fla.

Filed Dec. 3, 1974, Ser. No. 529,115
Int. Cl.[2] F01C *1/16, 11/00;* **F04C** *17/12, 23/00*
U.S. Cl. 418—9 **7 Claims**



1. A screw compressor system for compressing gaseous media adapted to compress small suction intake volumes of media and provided with a series of pairs of meshing rotors comprising two compression stages characterized in that the rotors of each series have an outside diameter which is large with respect to the suction intake volume of gas, one of said rotors of each series being a male rotor having teeth disposed in grooves of a female rotor, the axes of rotation of the second pair of rotors being spaced farther apart from each other than the axes of rotation of the first pair of rotors, and the ratio of the diameter of the rotors at the peripheral edge of the rotor teeth to the diameter of the rotor at the base of the teeth for the pairs of rotors being so related to provide grooves which compensate for the difference in volume between the intake of fluid to the first pair and the intake to the succeeding pair of rotors and wherein the rotors of the two compressor stages have essentially the same outside diameter, the ratio of the outside diameter to the dedendum diameter of the rotors in the second stage is smaller than the ratio of the outside diameter to the dedendum diameter of the rotors in the first stage and characterized in that the tooth contours of the rotors in the second stage are so designed that the ratio of tooth width of the female rotor at its narrowest point to the tooth groove width at its widest point is at least 1.0.

4,068,985

ROTARY ENGINE OR PUMP CONSTRUCTION

John S. Baer, Schooner Head, Bar Harbor, Maine 04609

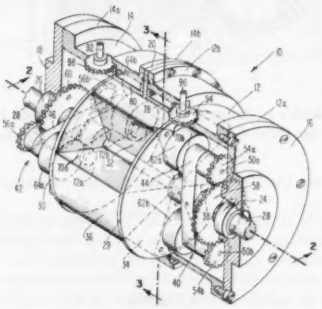
Filed Apr. 6, 1976, Ser. No. 674,141
Int. Cl.[2] F04C *1/00*
U.S. Cl. 418—36 **55 Claims**

1. A rotary engine construction comprising:
a housing providing a cylindrical cavity within and defined by cavity walls,
a drive shaft extending coaxially through said cylindrical cavity supported by the housing on the axis of the cavity in suitable bearings permitting rotation thereof,
an even number of imperforate movable walls extending at

least between said shaft and said cavity wall such that alternate movable walls are mechanically connected to move together in a first assembly and intermediate movable walls are mechanically connected to move together in a second assembly,

sealing structures on said first and second assemblies such that the spaces between the respective movable walls form energy chambers which are mutually isolated from one another,

separate drive coupling means respectively between points on each of said first and second assemblies spaced radially outwardly from the shaft and an associated rigid radial extension from the shaft outside the energy chambers, each respective coupling means including means permitting oscillatory movement of the respective assembly relative to said rigid radial extension and timing means



associated with each of the drive coupling means to assure a predetermined phasing in the movement of the movable walls relative to one another such that an integral number of oscillatory cycles occurs each full revolution of each movable wall, whereby each said coupling means is arranged to accommodate out-of-phase movements of said movable walls so that said oscillatory movement of said walls does not interfere with transmission of rotational movement to said shaft and energy from the walls is transmitted directly to the shaft,

inlet port means through the housing positioned in a wall of said cylindrical cavity to permit fluid to flow into the successive energy chambers as the walls move apart, and

outlet port means through the housing positioned in a wall of said cylindrical cavity, to permit fluid to be expelled from the successive energy chambers as the walls close together.

4,068,986

SEALING MEANS FOR RADIAL FACES OF PISTON IN ORBITAL PISTON DEVICE

Vukasin Todorovic, 220 Littleton Road, Parsippany, N.J. 07054

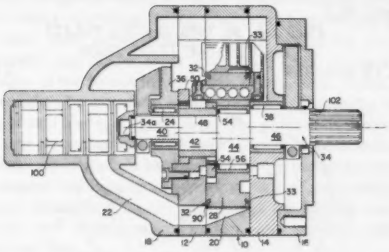
Filed Feb. 25, 1977, Ser. No. 772,125

Int. Cl.[2] F01C *1/02;* **F02B** *53/00;* **F01C** *19/08*

U.S. Cl. 418—61 R **7 Claims**

1. In a motor, engine, or pump having a piston mounted for rotation about an axis within a cylinder housing, said housing including radial faces and a plurality of combustion chambers, the improvement comprising sealing means disposed on at least one of the radial faces of said piston to seal said combustion chambers against leakage of working fluid. said sealing means comprising:

an annular seal ring including an annular band, said band including a plurality of spaced extension members which define pockets therebetween, each of said pockets having disposed therein a circumferential sealing member and spring means, each of said spring means operating to bias said annular band into engagement with one of the radial faces of said cylinder housing to prevent leakage of working fluid in a radial direction, and each of said circumferential sealing members preventing working fluid from



escaping from its corresponding pocket and leaking in a circumferential direction to an adjacent combustion chamber.

4,068,987

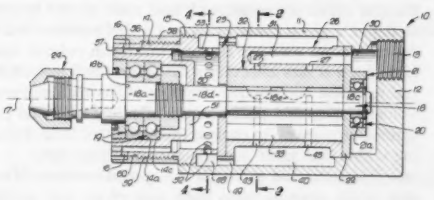
PNEUMATIC MOTOR WITH MUFFLED EXHAUST

Fuller A. Crooks, Huntington Beach, Calif., assignor to Elmer A. Selzer, Huntington Beach, Calif.

Filed July 23, 1976, Ser. No. 708,275

Int. Cl.[2] F01C *13/02, 21/00*

U.S. Cl. 418—181 **7 Claims**



1. In a pneumatic motor that includes a vaned rotor, a rotor chamber having a gas inlet and gas outlet means, a housing and an axially extending rotor shaft to rotate in said chamber, structure to control and muffle the escape of exhaust gas comprising

a. a first exhaust chamber extending about the rotor chamber and into which pressurized exhaust gas escapes from the rotor chamber,

b. a second exhaust chamber spaced axially from the first exhaust chamber and extending about the shaft, and primary porting communicating between the first and second exhaust chambers, said primary porting including multiple flow restricting ports circularly spaced about said shaft and spaced radially outwardly therefrom,

c. a third exhaust chamber extending about the shaft and located radially inwardly of the second exhaust chamber, there being radially inwardly extending porting spaced about the shaft and communicating between the second and third exhaust chambers to direct escaping exhaust directionally inwardly and in conflicting turbulent streams to dissipate energy contained in said streams,

d. there being additional exhaust gas escape porting extending generally axially from said third chamber and communicating with the exterior via radially directed outlets,

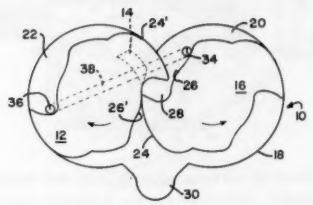
e. and a sleeve supported on the housing for rotation and progressive axial displacement in progressively closing relation with said outlets to selectively and variably control the escape of exhaust gas therefrom, said sleeve having threading connected with threading on the housing to provide said progressive axial displacement in response to said rotation of the sleeve relative to the housing.

4,068,988

POSITIVE-DISPLACEMENT, FLUID MACHINE

Paul Dale Webb, Tioga, Pa., and Larry Neil Willover, Painted Post, N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed July 30, 1976, Ser. No. 710,123
Int. Cl.[2] F04C *17/04, 29/00*
U.S. Cl. 418—189 **3 Claims**



1. A positive-displacement, fluid machine, such as a compressor, pump, expander, and the like, comprising:

a housing having end walls and arcuate side walls;

first means for admitting fluid into said housing;

second means for discharging fluid from said housing;

rotary piston means cyclically-movably disposed within said housing to rotate therewithin on axes normal to said end walls;

said rotary piston means having given surfaces formed thereon which cooperate with said walls of said housing to define a given chamber having a first volume, and to define another chamber having a maximum volume, upon said piston means effecting a first prescribed movement, and to define said another chamber as having a minimum volume, upon said piston means effecting a second prescribed movement, to enclose fluid admitted to said housing within said given and another chambers; and

means, formed in said end walls and spaced inwardly of said side walls, opening onto both said given and another chambers to cause said chambers to be in fluid communication; wherein

said piston means further has means occluding said means coincident with said another chamber achieving a volume intermediate said maximum and minimum volumes and retention of said first volume by said given chamber, to halt said fluid communication of said chambers; wherein

said piston means comprises a plurality of interengaging rotary pistons having mating lobes and recesses;

said lobes and recesses, together with said walls, cooperatively define therebetween a fluid pocket, adjacent and appendant to said another chamber, which, upon movement of said pistons, closes off from said another chamber and traps fluid therewithin; and

said occluding means halts said fluid communication of said chambers only following a closing off of said pocket.

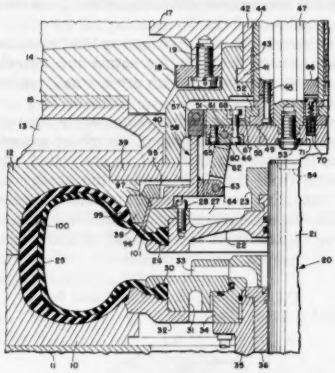
4,068,989

TIRE CURING PRESS

Armindo Cantarutti, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Sept. 3, 1976, Ser. No. 720,192
Int. Cl.[2] B29H *5/02*
U.S. Cl. 425—38 **40 Claims**

1. A tire curing press of the type wherein a top movable mold section moves vertically away from and horizontally with respect to a stationary bottom mold section, an upstanding bladder center mechanism in said stationary mold section which includes a movable top plate, and an expandable and collapsible chuck means in said movable mold section cooperating with said top plate and operative when expanded to secure the cured tire shortly after the press begins to open, first to hold the tire while the tire is stripped from the mold sections



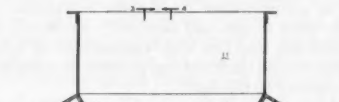
and the bladder is stripped from the tire, and then to remove the cured tire from the press with the movable mold section.

4,068,990

CONCRETE SLAB FORMING MACHINE

Arvids Kalns, 541 Central Ave., Albany, N.Y. 12206

Filed Mar. 26, 1976, Ser. No. 670,883
Int. Cl.[2] B28B *13/02*
U.S. Cl. 425—64 **11 Claims**



1. A concrete forming machine adapted for movement along a track over a flat surface comprising a carriage a portion of which coacts with the flat surface to form a mold cavity, a plurality of core members disposed longitudinally in the cavity in spaced parallel relation to each other, a hopper for a concrete mix mounted on the carriage, primary feed means in the carriage for delivering concrete mix from the hopper to an area adjacent the forward ends of the core members and for packing the mix above, below and between the members, said primary feed means having a portion thereof extending in front of the forward ends of and below the upper surfaces of the core members, secondary feed means in the carriage for delivering concrete mix from the hopper to an area above the core members at a point spaced rearwardly from the forward ends thereof and for packing the mix above and between the members, and power means on the carriage for advancing it along the track.

4,068,991

LAYER-FORMING APPARATUS ESPECIALLY FOR PARTICLE BOARD MATS

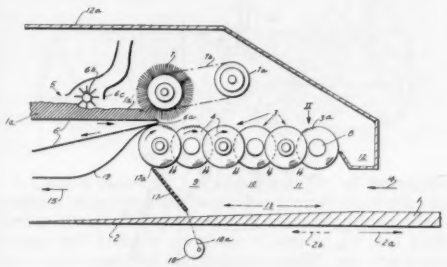
Werner Ufermann, Penzberg; Heinrich Axer, Nettetal-Hinsbeck, and Wolfgang Michels, Krefeld, all of Germany, assignors to G. Siempelkamp & Co., Krefeld, Germany

Filed Aug. 5, 1976, Ser. No. 711,836

Claims priority, application Germany, Aug. 8, 1975, 2535461

Int. Cl.[2] B29J 5/00

U.S. Cl. 425—81 **10 Claims**



1. An apparatus for forming a particle-board mat, comprising:

a mat-forming surface displaceable in a given direction;

a spreading head disposed above said surface, said spreading head comprising an array of mutually parallel interdigitated disk rollers defining between them spaces of a width increasing from an upstream side of said array to a downstream side thereof;

means for feeding particulate material to said array at said upstream side thereof whereby said particulate material passes downwardly between said rollers in a fine-particle column, an intermediate-particle column and a coarse-particle column, onto said surface;

means forming an air sifter between said head and said surface for promoting the separation of fine particles and the deposition thereof on said surface as a respective zone of the mat;

a separating sieve in said air sifter proximal to the upstream side of said array; and means for periodically displacing said sieve.

4,068,992

APPARATUS FOR MANUFACTURING TILES

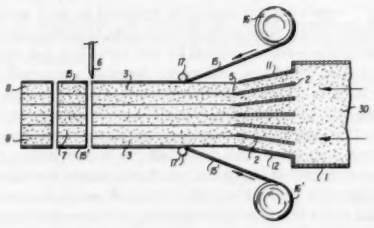
Arthur Buchel, Balzers, Liechtenstein, assignor to Interoptik Handelsanstalt, Liechtenstein

Continuation-in-part of Ser. No. 476,866, June 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 227,859, Feb. 22, 1972, abandoned. This application Apr. 29, 1976, Ser. No. 681,408

Claims priority, application France, Mar. 1, 1971, 71.06908

Int. Cl.[2] B28B 11/00, 11/12

U.S. Cl. 425—91 **9 Claims**



1. An apparatus for manufacturing tiles by extrusion of clay or a similar material, comprising a die having therein a number of spaced apart rigid blades for dividing the extruded material into a plurality of superposed layers, said blades being located upstream of the die outlet in planes which converge towards said die outlet, said blades being mounted to be pivotable about their outer ends; means attached to said blades for pivoting individually said blades about their outer ends; means at the side edges of the blades for ensuring an adjustable lateral feed of material to be extruded; means located substantially in the planes of said blades downstream of the outer ends thereof for projecting a powder product at right angles to the direction of extrusion into interstices between the layers; means for placing impermeable coatings on the outer surface of an assembly of extruded superposed layers; and means for cutting such an assembly, and impermeable coatings, into separate piles of superposed tiles.

4,068,993

APPARATUS FOR MOULDING CONFECTIONERY

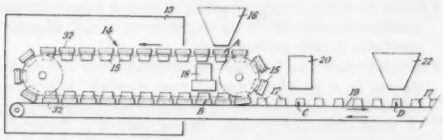
Raymond Gwilym Dacey, Hemel Hempstead, and Richard Hugh Verity, Ampthill, both of England, assignors to Baker Perkins Holdings Limited, England

Filed Aug. 28, 1975, Ser. No. 608,685

Claims priority, application United Kingdom, Aug. 30, 1974, 38097/74

Int. Cl.[2] A23G 3/12

U.S. Cl. 425—104 **6 Claims**



1. A confectionary moulding machine which comprises:

1. an endless mould conveyor which includes a pair of parallel chains and multiple moulds fixed to and straddling the chains; each mould having an upper surface, means forming cavities which have a predetermined depth, and projections which extend away from the upper surface in a direction opposite to the depth of the cavities, the projections extending a distance less than the depth of the cavities; said endless mould conveyor being mounted such that said moulds traverse in a continuous procession along an upper run in which the mould cavities face upwardly and a lower run in which the cavities face downwardly;

2. a depositor disposed above the upper run of the mould conveyor which is operative to deposit fillings of liquid confectionary into the moulds and thus into the cavities as the moulds move in succession along the upper run;

3. a band which is mounted so as to have a run which travels continuously beneath the lower run of the mould conveyor and in the same direction as the lower run of the mould conveyor;

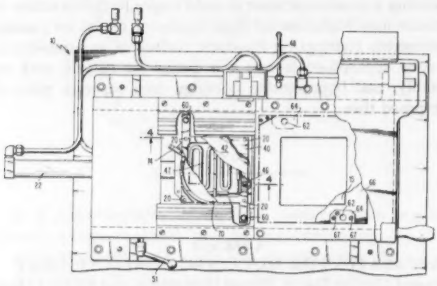
4. a demoulding unit which is operative to discharge the fillings of the cavities of each mould in succession onto the band; and

5. the relative positioning of the lower run of the mould conveyor and the run of the band being such that the projections which extend downwardly from the moulds when the moulds are on the lower run of the mould conveyor contact the surface of the run of the band and constrain the band to move at the same speed as the mould conveyor.

4,068,994
APPARATUS FOR THE PRINTING OF CERAMIC GREEN SHEETS

Robert H. Cadwallader, Wappingers Falls; Yves Darves-Bornoz, La Grangeville; Angelo S. Gasparri, Stormville, all of N.Y., and Francis A. Racine, Pompano Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,707
Int. Cl.[2] B29C 27/00
U.S. Cl. 425—110 8 Claims



1. An apparatus for printing a paste pattern on a ceramic green sheet provided with a plurality of alignment apertures comprising:

a loading station;

a printing station;

a stencil mask at said printing station;

a carrier for supporting a ceramic green sheet;

a means to locate a ceramic green sheet in a given reference position on said carrier by engagement of said alignment apertures in said green sheet;

a means to move said carrier horizontally from said loading station to a position beneath said printing station, and vertically to a position to be printed underlying said stencil mask, and back to said loading station in the reverse movement order;

said means to move said carrier comprised of a horizontal slide for slidably supporting said carrier;

a first lower part and a second upper part of said carrier;

an inclined camming surface between said first and second parts of said carrier;

an abutment for engaging said second upper part of said carrier which prevents further horizontal movement of the upper part of said carrier but allows further movement of said lower part of said carrier;

a means to move said lower part of said carrier horizontally along with said slide;

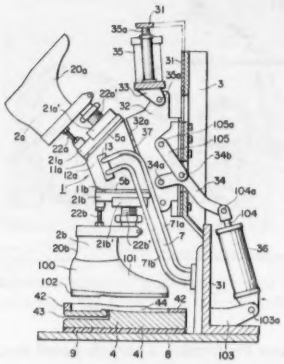
said means to move said lower part of said carrier capable in operation of moving the entire carrier as a unit from said loading station to a position beneath said printing station until said upper part of said carrier contacts said abutment, and to continue movement of said lower part of said carrier in a horizontal direction thereby camming said upper part of said carrier upwardly into printing position relative to said stencil mask, and to return the carrier to said loading station by the reverse order of said movements.

4,068,995
INJECTION MOLDING MACHINE FOR THE MANUFACTURE OF SHOES

Hideki Hayashi, 380, Nonaka, Kurume, Fukuoka, and Sadayoshi Ishii, 380, Tsubukuhon, Kurume, Fukuoka, both of Japan

Filed May 26, 1976, Ser. No. 689,973
Int. Cl.[2] B29F 1/10
U.S. Cl. 425—129 S 6 Claims

1. A shoe-injection molding machine for molding a sole and attaching same to a prefabricated instep, said machine comprising: a stationary base plate; at least one sole support assembly mounted on said base plate; a machine frame attached to said base plate; a slide vertically movable on and along said machine frame; a frusto-conical head rotatably mounted on said slide; a plurality of last supporting units adjustably mounted on side surfaces of said head; an insulating sheet between each of said last supporting units and said head; and means for cooling

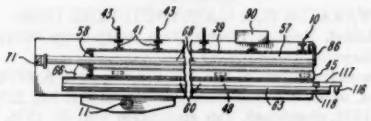


said head, said cooling means comprising a cooling liquid circulating system having coolant passages formed within said head, the main part of said passages being positioned in close proximity to said side surfaces on which said last supporting units are mounted, said system having inlet and outlet sockets positioned in close proximity to each other on a further side surface of said head, means operable to supply a cooling liquid to said inlet socket, and means operable to remove liquid from said outlet socket.

4,068,996
APPARATUS FOR MOLDING CONCRETE ARTICLES AND THE LIKE

Charles J. Heitzman, Honolulu, Hawaii, assignor to William J. Shannon, Miliani Town, Hawaii, a part interest

Filed Sept. 22, 1976, Ser. No. 725,634
Int. Cl.[2] B28B 21/90
U.S. Cl. 425—253 19 Claims



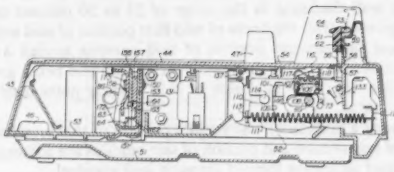
1. In apparatus for molding articles of self-hardening moldable material and including a mold box, means supporting said mold box for tilting movement between a generally vertical filling position and a generally horizontal stripping position, means for supplying the moldable material to said mold box when in said filling position to form an article within said mold box, a mold box member carried by said mold box and movable relative to said mold box, and means forming a generally horizontal platform disposed for receiving a molded article from said mold box after said mold box is moved to said stripping position, the improvement comprising power operated stripping means associated with said platform and including a pulling member movable along said platform, means for releasably connecting said pulling member to said mold box member when said mold box is in said stripping position, and means for moving said pulling member along said platform for pulling said mold box member to effect stripping of a molded article from said mold box onto said platform.

4,068,997

CUTTING MEANS FOR BOOK BINDING MACHINE

George E. Elder, San Jose; Clark A. Van Horne, Santa Clara, and George C. Wu, San Jose, all of Calif., assignors to Velo-Bind, Inc., Sunnyvale, Calif.

Division of Ser. No. 625,949, Oct. 28, 1975, Pat. No. 3,994,055.
This application June 2, 1976, Ser. No. 692,200
Int. Cl.[2] B29C *17/08*
U.S. Cl. 425—305.1 6 Claims



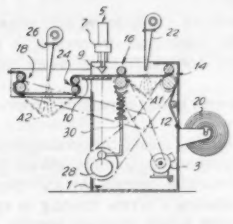
1. Cutting means for use with a plurality of thermoplastic members comprising locating means for said members, a knife formed of a thin narrow ribbon of metal, electrical means for heating said knife by resistance, a support for said knife, a frame, guide means on said frame for guiding movement of said support from a first position remote from said members to a second position at which said knife cuts through said members, and support actuating means to move said support from first position to a second position and back to first position, said electrical means having a first switch to pass current through said knife as said support leaves first position and a second switch to cut off current to said knife when said support has heated said knife sufficiently to cut said members as said support reaches second position, said guide means having a third position in a direction relative to said second position at a right angle to the direction of movement of said support from first to second position whereby said knife first forms heads on stubs of cut material of said members and then cools said heads.

4,068,998

APPARATUS FOR PROCESSING CONTINUOUSLY-FED PLASTICS MATERIAL

Enrico Attucci, and Fernando Attucci, both of Via Imprunetana 183, Mezzomonte, Impruneta, Florence, Italy (I-50023)

Filed Aug. 12, 1976, Ser. No. 713,918
Claims priority, application Italy, Aug. 21, 1975, 9525/75
Int. Cl.[2] B29C *17/04*
U.S. Cl. 425—317 12 Claims



1. In an apparatus for processing plastics material in strip-like form including either embossing, scoring or shearing plastics strip material.

means for continuously feeding the material, means defining a material feed path,

tool means for performing a processing operation on the material in a working zone of the apparatus,

means for cyclically operating the tool means,

said material feed path being arranged to permit a material storage loop to be formed in a portion of the path and to remove the material storage loop,

said portion being defined between the feed means and said working zone,

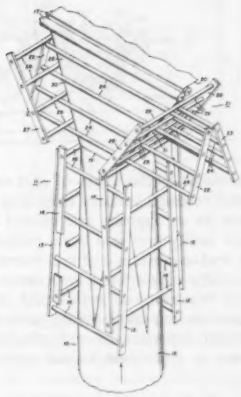
means enabling the material to be drawn from the loop at a speed higher than the feed speed of the continuous feed means to remove the material storage loop, and to be stretched in said portion of the path, and means for braking the material in the material feed path and for stopping the feed of the material in said working zone during operation of the tool means.

4,068,999

BLOWN TUBE COLLAPSE FRAME ASSEMBLY

Charles W. Dawson, Marblehead, Mass., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 349,643, April 9, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 666,508
Int. Cl.[2] B29C *15/00*
U.S. Cl. 425—392 6 Claims



1. In a blown tube apparatus in which an inflated circular cross section thermoplastic tube is collapsed from the circular section to a line or flat section, an improved collapsing frame assembly next preceding said flat section comprising

a. a frame assembly to surround said tube,

b. tube surface engaging means in said frame to engage said tube over an extended length thereof to converge said cross section to a substantially square cross section without significantly stretching or compressing said tube material,

c. a transition section on said frame assembly next adjacent said line section to collapse said square section to said line section

1. said transition section comprising two pairs of oppositely positioned and oppositely angled planar tube surface engaging means, the pairs of which are coincident with the parallel sides of said square section and each planar set of tube surface engaging means having an angle θ_1 between its plane and the longitudinal axis of the tube which are essentially equal so that points on said square section arrive at the line section along lines perpendicular thereto.

4,069,000

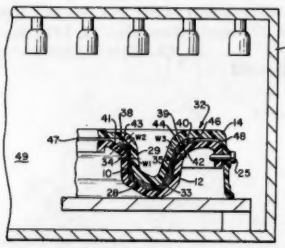
MOLD FOR SHAPING AND CURING REINFORCED PLASTIC MATERIAL

William J. Hampshire, Peninsula, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 12, 1976, Ser. No. 675,993
Int. Cl.[2] B29C *17/02*
U.S. Cl. 425—395 10 Claims

1. A mold for shaping and curing a fiber reinforced body of plastic material comprising a female mold member and a male mold member for supporting a preform of oriented plastic coated fibers therebetween, a transverse plane through said

female and male mold members, said female mold member having a mold cavity extending in one direction from said transverse plane, said male mold member having a core extending in said one direction from said transverse plane, said male mold member being movable toward said female mold member upon closing of said mold with said core movable into said cavity for urging said preform into a molding space defined by said core and the surface of said female mold member in said cavity, said female mold member having sloped lead-in surfaces at the edges of said cavity, said male mold member having recessed surfaces at the edges of said core, said lead-in surfaces and said recessed surfaces extending away from said transverse plane on an opposite side of said transverse plane from said mold cavity and said core, peripheral spaces enclosed by said lead-in surfaces and said recessed surfaces permitting substantially unrestricted movement of said preform from a position between said male mold member and said female mold member into said molding space during closing of said mold without distortion of said oriented plastic coated fibers and means to apply heat to said mold for curing said preform.



4,069,001

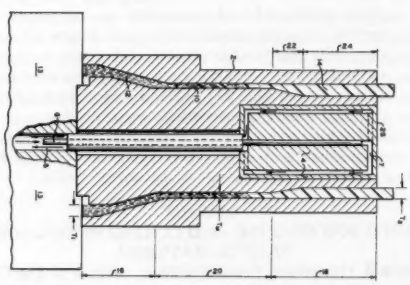
APPARATUS FOR FORMING A THICK-WALLED TUBULAR PRODUCT

Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 301,899, Oct. 30, 1972, Pat. No. 3,980,746, which is a continuation-in-part of Ser. No. 76,100, Sept. 28, 1970, abandoned. This application July 22, 1976, Ser. No. 707,724

Int. Cl.[2] B29F *3/08*

U.S. Cl. 425—467 **4 Claims**



1. An extrusion die assembly for forming a thick-walled tubular product, including a mandrel and bushing, said bushing having an axis and an opening extending therethrough for coaxially receiving said mandrel and said mandrel having an axis and a plurality of fluid pathways formed therethrough for passing a cooling fluid through the mandrel for cooling extrudate passing from an associated dynamic extruder through an annulus formed between said mandrel and said bushing, the improvement comprising:

said annulus having first, middle and second portions, the first portion being located upstream with respect to the second portion, said middle portion of said annulus having a wall thickness in the range of 25 to 50 percent of the greatest wall thickness of said first portion of said annulus and said second portion of said annulus having a wall thickness greater than one-quarter inch and being greater than the wall thickness of said middle portion of said annulus, and

at least a portion of said middle portion of said annulus and of said second end portion of said annulus are adjacent the fluid pathways formed through said mandrel.

4,069,002

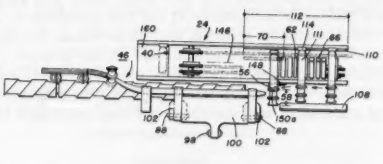
APPARATUS IMPROVEMENTS IN REMOVING ARTICLES FROM WHEEL BLOW MOLDING MACHINES

John F. Seelye, Thomaston, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 576,559, May 12, 1975, Pat. No. 4,041,124. This application July 22, 1976, Ser. No. 707,858

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—539 **15 Claims**



1. In a continuous blow molding apparatus comprising:

a wheel arranged to rotate in a substantially vertical plane;

plural molds carried with said wheel having outer sections substantially radially movable with respect to the wheel axis to open said molds;

means operatively associated with said molds operable to blow mold articles in said molds;

eject means releasing elongated still hot articles from the molds; and

a pocket conveyor transporting said released articles in a substantially horizontal orientation in pockets along a substantially horizontal plane away from said vertical plane;

the improvements in said apparatus comprising, in combination:

A. article turning means cooperating with said conveyor by receiving and turning the articles from said substantially horizontal orientation and plane into another plane including a screw rotating in synchronism with the pockets which engages specific portions of the articles in the thread portion of said screw.

4,069,003

INJECTION MOLDING APPARATUS

Ronald L. Cecchi, Brookfield, Ill., assignor to Dinamode Corporation, Villa Park, Ill., a part interest

Filed Apr. 21, 1975, Ser. No. 569,811

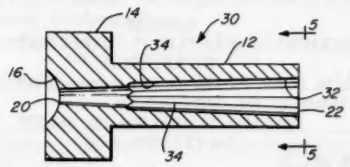
Int. Cl.[2] B29F *1/03*

U.S. Cl. 425—568 **1 Claim**

1. A sprue bushing for use with a mold in plastics injection molding operations wherein a sprue is integrally formed at each injection with the part being molded, said sprue bushing comprising:

a generally cylindrical body member having an inner end, an outer injection end, and a longitudinal frusto-conical bore extending therethrough between said ends, said bore being concentric with the central longitudinal axis of the body member and tapering outwardly toward said inner end, and

a plurality of straight elongate grooves formed in the wall of said bore extending longitudinally over at least 50% of the length thereof and converging toward said injection end,



adjacent sides of adjacent grooves converging to apices at a first radial distance from the central longitudinal axis of the bore, and sides of each groove converging to points at a radial distance from the central longitudinal axis substantially greater than said first radial distance,

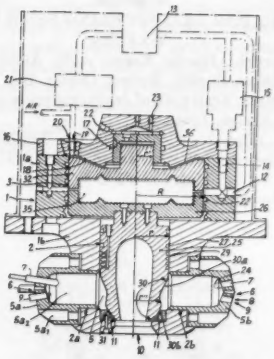
said grooves thereby increasing the surface area of the bore to enhance heat transfer and producing a sprue which is readily released from the bushing with simple longitudinal and non-rotational relative movement therebetween.

4,069,004

DEVICE TO EMIT SHOCK WAVES, WITH ADJUSTABLE CAPACITY

Leon Sayous, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed June 15, 1976, Ser. No. 696,351
Claims priority, application France, June 20, 1975, 75.19452
Int. Cl.² F23C *3/02*
U.S. Cl. 431—1 **2 Claims**



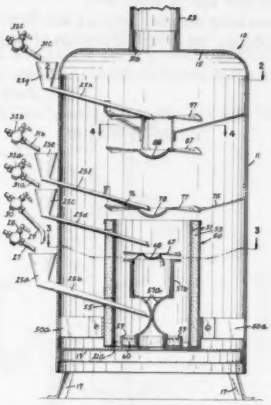
1. A shock-wave emitting device comprising a valve, a barrel with a seat for this valve, said barrel and valve being arranged coaxially, and forming between them an annular combustion chamber, which can be placed in communication with the outside atmosphere by axial movement of the valve, and which comprises means of admitting the fuel-oxidant mixture, and ignition means, the said valve comprising a differential piston, one side of which forms a mobile wall of a pressurized fluid chamber, and part of the other side of which forms a mobile wall of the combustion chamber, a fixed wall portion of the combustion chamber containing at least two regularly spaced apertures at its periphery, into which fit removable plugs, each of which comprises a cavity opening into the combustion chamber.

4,069,005

METHOD AND APPARATUS FOR PRODUCING HEAT

Narayanaswami Palani, 2500, IV Avenue, Annanagar, Madras-40, India

Continuation-in-part of Ser. No. 666,422, March 16, 1976. This application Apr. 29, 1976, Ser. No. 681,452
Int. Cl.² F23J *7/00*
U.S. Cl. 431—4 **14 Claims**



1. The heat generating process which comprises:

a. continuously introducing a carbonaceous fuel, oxygen, and water into a preheated first reaction zone, said preheated first reaction zone containing a first catalytic surface comprising a transition metal;

b. permitting the resulting fuel/water/oxygen mixture to form hot gaseous reaction products in the presence of said catalytic surface;

c. deflecting a portion of the sensible heat produced by said steps (a) and (b) back into said first reaction zone, while simultaneously passing a gas steam comprising said hot gaseous reaction products and unreacted oxygen upwardly out of said first reaction zone into a second reaction zone containing a second catalytic surface, whereby any unburned combustible reactants in said gas stream are burned to produce additional hot reaction products in said second reaction zone;

d. deflecting a portion of the sensible heat produced in said second reduction zone back toward said first and second reaction zones, whereby the elevated temperature of said first and second catalytic surfaces can be continuously maintained and the catalytic action in said first and second reaction zones can be continuously maintained, while simultaneously passing a flue gas stream out of said second reaction zone toward a flue gas opening; and

e. obtaining heat energy from said flue gas stream.

4,069,006

HOUSEHOLD AND BARBECUE TORCH LIGHTER

Crowell B. Jackson, 179 E. 79th St., New York, N.Y. 10021

Filed June 30, 1976, Ser. No. 701,093
Int. Cl.² A21D *2/00*
U.S. Cl. 431—344 **4 Claims**

1. A gas lighter comprising:

a lighter body having a reservoir portion for holding a supply of volatile liquid fuel,

a normally closed valve for controlling the flow of gaseous fuel from said reservoir,

a sparking ignition means disposed in igniting relationship with said normally closed valve,

a valve actuator connected to said normally closed valve,

means for pivotally mounting said valve actuator on said lighter body,

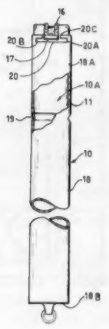
said actuator having a portion extending beyond the periphery of said lighter body,

means for positively maintaining and locking said valve actuator in the open valve position for maintaining said lighter ignited upon ignition,

said latter means, including a member circumscribing said lighter body,

said circumscribing member being mounted for rotation relative to said lighter body, and

said circumscribing member having a slot formed therein for accommodating the extended portion of said valve actuator,



said slot having a lateral offset leg portion for receiving said extended portion in the opened valve position upon effecting a predetermined relative rotation between said lighter body and said circumscribing member so as to positively lock said valve actuator in the open valve position for maintaining ignition,

said lighter including a flame adjusting lever, and said circumscribing member includes a notched out portion for accommodating said adjusting lever, said notched out portion being disposed opposite said slot.

4,069,007

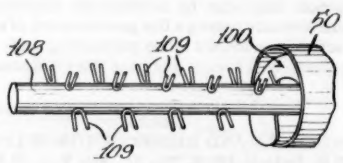
ROTARY RETORT FURNACE

Jonathan Smith, Glen Ellyn, Ill.; Robert C. Larko, and Eugene E. Booth, both of Meadville, Pa., assignors to Sunbeam Equipment Corporation, Meadville, Pa.

Division of Ser. No. 615,281, Sept. 22, 1975, Pat. No. 4,025,297. This application Oct. 26, 1976, Ser. No. 735,641

Int. Cl.² F27D *1/16*

U.S. Cl. 432—3 **3 Claims**



1. A method of forming an internal helical auger for a rotary retort furnace comprising, forming a number of toroids from a resilient material, making a radial cut in each of said toroids, slightly deforming each of said radially cut toroids to form a single flight of a helix, fastening one of the edges of each of said flights resulting from said radial cut to an opposite edge of another of said flights resulting from said radial cut to form a helix subassembly, said subassembly having a free edge of a flight resulting from said radial cut at each end, axially expanding while radially compressing said subassembly by screwing said subassembly onto a shaft having a number of guide pins at preselected intervals, inserting said subassembly and said shaft into a cylindrical retort member of a predetermined length, fastening one of said free ends of said subassembly to the one end of said retort, removing said shaft by unscrewing it from the subassembly while forcing the shaft and the subassembly axially into the retort member permitting and urging said resilient subassembly to radially expand into contact with the inside walls of said retort member, and upon removal of said shaft securing the other of said free ends of said subassembly to the other end of said retort.

4,069,008

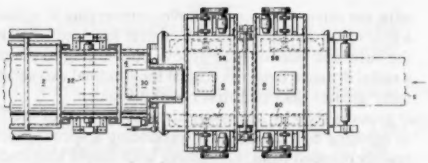
METHOD AND APPARATUS FOR HEATING A WORKPIECE

William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Mar. 19, 1976, Ser. No. 668,570

Int. Cl.² F27B *9/28*

U.S. Cl. 432—8 **14 Claims**



1. A method of heating a steel strip which comprises continuously passing uncoiled strip through the heating chamber of a jet recuperator and then through a main heating chamber where heat is provided by burning fuel, preheating the strip in said jet recuperator by taking waste gases from combustion of said fuel through outlet means offset transversely from the center of said recuperator and intermediate the length of said recuperator and forcing said waste gases through spaced holes against the top and bottom of said strip, and then heating the strip to the desired temperature in said main heating chamber.

4,069,009

APPARATUS FOR TRANSFERRING SEMICONDUCTOR WAFERS

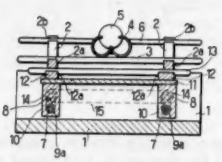
Masao Yamawaki, Handa; Katsuo Aoki, Aichi; Yoshio Oka, Toyota; Takao Suzuki, Kariya; Osamu Ina, Okazaki, and Kinihiko Hara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 8, 1976, Ser. No. 730,720

Claims priority, application Japan, Oct. 9, 1975, 50-122111

Int. Cl.² F27B *9/14*

U.S. Cl. 432—122 **10 Claims**



1. An apparatus for transferring semiconductor wafers comprising:

a boat on which semiconductor wafers are loaded;

a body having a pair of side walls;

a pair of first supporting bars, positioned in a fixed relationship with said body, for supporting said boat between said side walls;

a movable unit having a lateral width narrower than the distance between said first supporting bars;

an actuator, operatively coupled to said movable unit, for

rotating said movable unit between said first supporting bars; and

a pair of second supporting bars, positioned on said movable unit, for uplifting and transferring said boat during when said second supporting bars are kept higher than said first supporting bars.

4,069,010

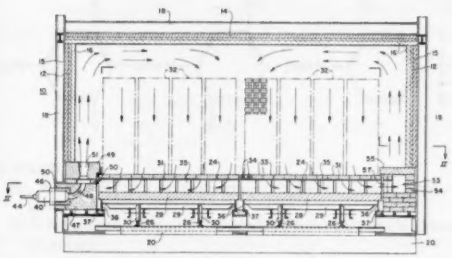
KILN FOR CERAMIC PRODUCTS

Gordon C. Fay, Pittsburgh, Pa., assignor to Hendryx Engineers Incorporated, Pittsburgh, Pa.

Filed June 16, 1976, Ser. No. 696,824

Int. Cl.[2] F27B *9/26, 9/08*

U.S. Cl. 432—137 **2 Claims**



1. A kiln for firing ceramic ware comprising an enclosing structure having side walls and a roof, movable floor means for supporting the ware within the enclosing structure, said floor means being adapted to permit gas to flow downward therethrough and including means for exhausting gas laterally below the level of the floor, a flue extending longitudinally of the kiln along each side wall near the bottom thereof, each flue having a plurality of ports therein in position to receive gas exhausted from said floor means, whereby said gas flows longitudinally in said flue, a plurality of burners spaced apart along each side wall near the bottom thereof, said burners being the sole source of heat in the kiln, each burner including means for directing a stream of hot gas vertically upward in the kiln adjacent the side wall, a refractory block associated with each burner having a vertical Venturi passage therein positioned to receive the stream of hot gas from the burner, the burners and associated blocks being disposed in the flues at spaced intervals and each burner and its associated block being vertically spaced apart to permit gas in the flue to flow between them, and external means for supplying air to said burners in excess of the amount required for combustion to induce a high velocity stream of gas from each burner such that a major portion of the gas flowing in the adjacent flue is entrained in said stream to sustain a high velocity upward flow of a large volume of gas, said gas being redirected by the roof of the kiln to flow downward through the ware.

4,069,011

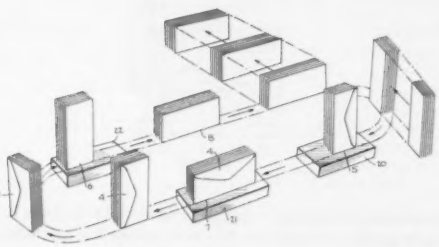
ENVELOPE OPENING MACHINE

William H. Gunther, Jr., Guilford, Conn., assignor to Thor Dahl, Inc., New York, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,741

Int. Cl.[2] F24J *3/00*

U.S. Cl. 432—230 **38 Claims**



1. A machine for applying heat to the edges of envelopes having sensitizing and developing agents thereon which comprises a frame, a conveyor means, first, second and third heaters mounted on said frame in proximity to the conveyor, envelope moving means mounted on the conveyor means to move envelopes relative to said heaters, said moving means adapted to move one edge of the envelope over said first heater to apply heat thereto, means on said frame for rotating the envelope 90° to rest a second edge of said envelope on said second heater, said moving means adapted to move said second edge over the second heater to apply heat thereto, means on said frame for rotating the envelopes 90° to rest a third edge of said envelope on said third heater, said moving means adapted to move the third edge over said third heater to apply heat to said third edge, whereby the heat applied will deteriorate the said edges.

4,069,012

DYEING OF POLYESTER FABRIC WITH DISAZO DYE

Ernst Heinrich, Frankfurt am Main, and Joachim Ribka, Offenbach (Main)-Burgel, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

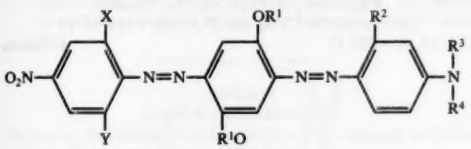
Continuation of Ser. No. 667,220, March 15, 1976, abandoned, which is a continuation of Ser. No. 560,618, March 21, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,392

Claims priority, application Germany, Mar. 26, 1974, 2414477; Dec. 21, 1974, 2460775

Int. Cl.[2] C09B *27/00, 31/02*

U.S. Cl. 8—41 C 13 Claims

1. In the process of dyeing a polyester fabric with a dispersion of a water-insoluble dye, the improvement wherein said dye is:



in which

R^1, R^3 and R^4 can be the same or different lower alkyl or lower alkenyl,

R^2 is hydrogen, halogen, lower alkyl, lower alkoxy or lower alkenoxy,

X is hydrogen, chlorine, bromine, nitrile or nitro, and

Y is hydrogen, chlorine or bromine.

4,069,013

ANTI-DUSTING FORMULATIONS

Helmut Hett, Offenbach (Main), and Kurt Walser, Bergen-Enkheim, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed May 21, 1976, Ser. No. 688,579

Claims priority, application Germany, May 24, 1975, 2523096

Int. Cl.[2] C09B *67/00;* D06P *1/64*

U.S. Cl. 8—79 10 Claims

1. In a dyestuff formulation having added material dispersed in it to impart dusting resistance to the formulation when powdered, the improvement according to which the added material is a mixture of a mineral oil boiling in the range of from about 140° to about 310° C, and emulsifier having a polyethoxy hydrophile in an amount sufficient to disperse the oil.

10. A mixture of about 65 to about 95% by weight mineral oil boiling in the range of about 140° to about 310° C, with about 5 to about 35% by weight of an emulsifier having a polyethoxy hydrophile.

4,069,014

PROCESS AND APPARATUS FOR BLEACHING TEMPERATURE-SENSITIVE FIBERS

Enzo Pintar, Busto Arsizio, (Varese), Italy, assignor to Mezzera S.p.A., Milan, Italy

Filed June 23, 1976, Ser. No. 698,996

Claims priority, application Italy, Aug. 29, 1975, 26714/75

Int. Cl.[2] D06L *3/02*

U.S. Cl. 8—111 24 Claims

1. A process for bleaching temperature-sensitive fibres, said process comprising the steps of:

applying to said fibres a bleaching agent which bleaches the fibres slowly and releases heat,

adding to said fibres at least one substance which undergoes a chemical or physical change with the absorption of heat,

collecting the treated fibres into a large mass such that said added substance is distributed throughout the mass of fibres, and

leaving the fibres in contact with said bleaching agent and said added substance for an extended period during which said added substance undergoes a physical or chemical change and absorbs the heat released by said bleaching agent whereby at least to reduce the temperature rise of the mass of fibres during bleaching.

4,069,015

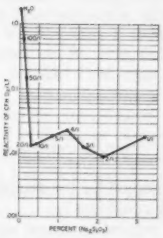
METHOD OF INHIBITING RUSTING OF SPONGE IRON

William A. Ahrendt, and David C. Meissner, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Sept. 19, 1975, Ser. No. 614,830

Int. Cl.[2] C23F *9/02*

U.S. Cl. 21—2.5 R 38 Claims



1. A method of inhibiting oxidation of sponge iron consisting of contacting said sponge iron with a solution consisting of an aqueous solution of alkali metal silicate.

4,069,016

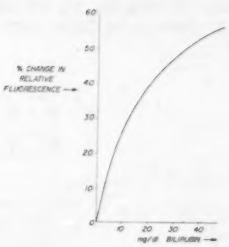
ASSAY FOR BILIRUBIN

Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,530

Int. Cl.[2] G01N *31/22, 33/16*

U.S. Cl. 23—230 B 33 Claims



1. A method for the detection of bilirubin in an aqueous liquid sample which comprises

a. contacting together in a reagent zone said liquid sample and an interactive composition,

such interactive composition containing a bilirubin-active complex comprising a diffusible, bilirubin-displaceable, detectable ligand bound to a carrier which can also bind bilirubin, said carrier having a first order binding constant to bilirubin in excess of 10^7 and a first order binding constant to said detectable ligand which is in excess of 10^5 but less than the aforementioned binding constant to bilirubin,

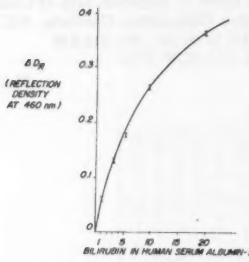
whereby bilirubin displaces said detectable ligand from said interactive composition, and

b. selectively detecting said detectable ligand.

4,069,017
COLORIMETRIC ASSAY FOR BILIRUBIN

Tai-Wing Wu, Rochester, and Glen Marshall Dappen, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,529
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 23 Claims



1. A colorimetric method for the detection of bilirubin in an aqueous liquid which comprises

a. contacting in a reagent zone said aqueous liquid and an interactive mordant composition for bilirubin, such interactive mordant composition having one or more binding sites for bilirubin and comprising a hydrophobic organic matrix and at least one charge-bearing cationic group,

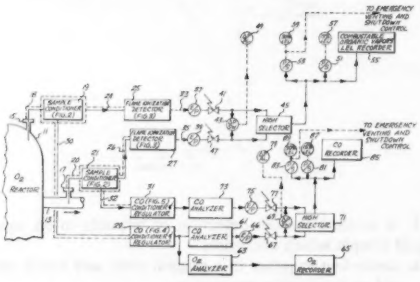
whereby bilirubin is mordanted, said mordanted bilirubin exhibiting an absorption peak shifted at least about 10 nm. from that of free bilirubin and a molar extinction coefficient at least about 50 percent higher than that of free bilirubin, and

b. colorimetrically detecting said mordanted bilirubin.

4,069,018
EXPLOSIVE GAS MONITORING METHOD AND APPARATUS

John D. Karna, Renton; Gregory K. Brock, Kelso, and Daniel M. Shellhammer, Longview, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Sept. 28, 1976, Ser. No. 727,360
Int. Cl.[2] G08B *21/00;* G01N *33/00*
U.S. Cl. 23—232 E 32 Claims



1. A method of monitoring an atmosphere containing combustibles to provide an indication of the inflammability potential of the atmosphere in terms of LEL based on the level of combustibles in the atmosphere being monitored, said method comprising the steps of:

sampling the atmosphere to obtain samples thereof;

determining the combustible organic vapors content of the samples in terms of percent LEL based on the total carbon atom concentration of combustible organic vapors present in the samples;

determining if the combustible organic vapors content of the samples is above a predetermined percent LEL;

providing an indication when the combustible organic vapors content is above said predetermined percent LEL;

determining the carbon monoxide content of the samples in terms of percent LEL based on carbon monoxide present in the samples;

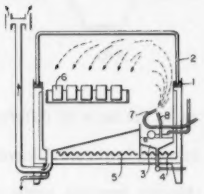
determining if the carbon monoxide content of the samples is above a predetermined percent LEL; and

providing an indication when the carbon monoxide content is above said predetermined percent LEL.

4,069,019
SEAL STRUCTURE FOR TANK LID OF SPRAY CORROSION TESTER

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Sept. 16, 1976, Ser. No. 723,935
Int. Cl.[2] G01N *17/00;* B65D *53/06;* F16J *15/14*
U.S. Cl. 23—253 C 4 Claims

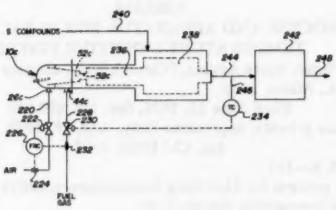


1. In a spray corrosion test apparatus comprising an open topped test tank and a lid having vertically depending sides to cover the top of said tank, said test tank having provided around the top edge of its vertical wall a horizontal upwardly open channel, said channel being adapted to receive the edge of the vertically depending sides of said lid, the improvement wherein the height of the outer vertical wall of the channel is higher than the inner vertical wall of said channel, said channel being filled with a flexible porous insert of a water absorbing material up to the level of the inner vertical wall of the channel.

4,069,020
PRODUCTION OF REDUCING GASES

Desmond H. Bond; George W. Taggart, both of Dallas, and Kurt S. Jaeger, Hurst, all of Tex., assignors to Ford, Bacon & Davis Texas Inc., Garland, Tex.

Division of Ser. No. 508,671, Sept. 23, 1974, Pat. No. 3,963,443.
This application Mar. 31, 1976, Ser. No. 672,409
Int. Cl.[2] C01B *17/02;* F23N *1/02*
U.S. Cl. 23—262 6 Claims



1. An apparatus for reducing gaseous compounds comprising:

a. elongated gas flow chamber having a first end which carries an inlet thereto and a second end which carries an outlet therefor;

b. a thermal reaction chamber communicating with said outlet of said second end of said elongated gas flow chamber and having its outlet spaced therefrom;

c. an air injection means for injecting air into said elongated gas flow chamber through said inlet thereof toward said

outlet thereof, from points uniformly about the inner periphery of said elongated gas flow chamber;

d. gas nozzle means positioned adjacent said second end and around said elongated gas flow chamber and directed into said elongated gas flow chamber and toward said thermal reaction chamber, for injecting fuel gas therewithin;

e. a furnace chamber comprising a chamber with an inlet and an outlet, and having its inlet operatively communicating with said outlet of said thermal reaction chamber;

f. a mixing chamber operatively communicating with the outlet of said furnace chamber and having an inlet means for passing said gaseous compounds to be reduced therewithin, and an outlet; and,

g. a catalytic reactor containing a reducing catalyst and conduit means for passing a gas mixture from the outlet of said mixing chamber to said catalytic reactor, and means to withdraw reduced compounds from said catalytic reactor.

4,069,021
OXYGEN GENERATOR

Warren J. Schneider, Fort Lauderdale, Fla., assignor to Green Cross Solid State Oxygen, Inc., Dania, Fla.

Filed Jan. 17, 1977, Ser. No. 759,844
Int. Cl.[2] B01J *7/00*
U.S. Cl. 23—281 **3 Claims**

1. In an oxygen producing device including a canister with an exit opening and a sealing means covering said exit opening, an oxygen candle generating means in said canister, and an ignition device, the improvement comprising;

said ignition device connected to and sealed to said canister above said opening in said canister for igniting said oxygen candle generating means in the canister,

said ignition device includes a manifold with an inlet and outlet, a capsule filled with ignition material connected to and positioned within said manifold, and an ignition mechanism connected within said manifold, said ignition mechanism including a plunger rod arranged and movably connected to said manifold for opening said capsule and said sealing means,

said inlet, said capsule and said rod positioned over said exit opening,

said rod having a distal end positoned in said manifold and arranged for movement throughout said ignition material and said sealing means to transfer said ignition material through said exit opening into contact with said candle to ignite said candle,

said oxygen producing device includes an outer cover of non-metallic material, and fin means connected between said outer cover and said oxygen producing device, said outer cover having an outer surface,

said outer cover and said fins arranged and designed to provide a cool outer surface during the burn cycle of said candle,

said outer cover includes a plurality of openings and is spaced from said canister for the circulation of air for cooling purposes.

4,069,022
WATER-FREE LIQUID FUEL SLURRY

Grant W. Metzger, San Andreas, Calif., assignor to Carbonoyl Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 446,302, Feb. 27, 1974, Pat. No. 3,907,134. This application July 9, 1975, Ser. No. 594,393
The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 **7 Claims**

1. A substantially water-free, high solid content, stable and combustible fuel slurry comprising:

about 5 to about 50 weight percent of a solid particulate carbonaceous material, about 94 to about 49 weight percent of a liquid hydrocarbon fuel, a minor slurry suspension stabilizing amount of starch, and a non-aqueous slurry viscosity reducing amount of an anionic surfactant and being present in an amount sufficient to maintain said slurry at a viscosity below about 300 seconds Saybolt Universal when said slurry is at a temperature of about 175° F.

4,069,023
CARBOXYLATE ESTERS OF 1-AZA-3,7-DIOXABICYCLO[3.3.0] OCT-5-YL METHYL ALCOHOLS, THEIR PREPARATION AND USE AS ADDITIVES FOR OLEAGINOUS COMPOSITIONS

Stanley J. Brois, Wantage, England; Jack Ryer, East Brunswick, and Esther Winans, Colonia, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

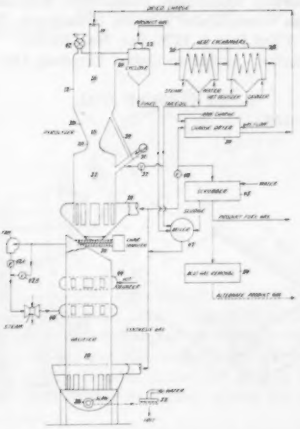
Division of Ser. No. 573,545, May 1, 1975, Pat. No. 4,017,406. This application Dec. 20, 1976, Ser. No. 752,873
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—63 **16 Claims**

1. A petroleum fuel oil composition comprising a major amount of fuel oil and in the range of about 0.001 to 0.5 wt. % of an oil dispersible or soluble ester which is the ester reaction product of: (a) about 1 molar proportion of a mono or a dicarboxylic acid or anhydride, having an aliphatic hydrocarbyl chain of about 6 to about 300 carbon atoms esterified with the reaction product of (b) either about 1 or 2 molar proportions of an aldehyde, or one molar proportion of ketone and one molar proportion of aldehyde, reacted with about 1 molar proportion of tris(hydroxymethyl) aminomethane; said ester reaction product having a 1-aza-3,7-dioxabicyclo[3.3.0] octyl ring.

4,069,024
TWO-STAGE GASIFICATION SYSTEM

John Henry Fernandes, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 9, 1977, Ser. No. 794,777
Int. Cl.[2] C10J *3/08*
U.S. Cl. 48—197 R **13 Claims**



1. A method of producing a fuel gas from a carbonaceous material which comprises the steps of:

a. providing an upright gasifier with an oxidation zone intermediate a preheating zone and a subjacent reducing zone,

b. introducing devolatilized carbonaceous material and limestone to said preheating zone of the gasifier,

c. oxidizing the carbonaceous material to form a gaseous product, a char containing carbon, and a molten slag,

d. reacting said gaseous product with steam and carbon from said char to form a hot reducing type synthesis gas,

e. providing a vertical shaft pyrolyzing furnace having a

"restricted throat" section intermediate a disengaging section and a subjacent reaction section,

f. introducing the hot synthesis gas from the bottom of the gasifier to the bottom portion of the pyrolyzing furnace in the reaction thereof,

g. introducing a charge of carbonaceous material and limestone to the top of the pyrolyzing furnace in the disengaging section thereof,

h. maintaining an upward flow of said hot synthesis gas through the pyrolyzing furnace in opposition to the descending flow of carbonaceous material and limestone whereby said carbonaceous material is heated and partially volatilized to permit the volatile constituents thereof to combine with the synthesis gas passing therethrough to increase the hydrocarbon content thereof before it is exhausted as a final product gas said restricted throat section being formed so as to cause the descending carbonaceous material to be slowed down at first, and then be propelled upward and outward thereby causing circulation of the carbonaceous material in the form of a spouting bed,

i. and transferring devolatilized carbonaceous material and limestone from the bottom of the pyrolyzing furnace to the gasifier as feedstock for the gasifier according to step (b).

4,069,025
BLAST IMPELLOR WHEELS

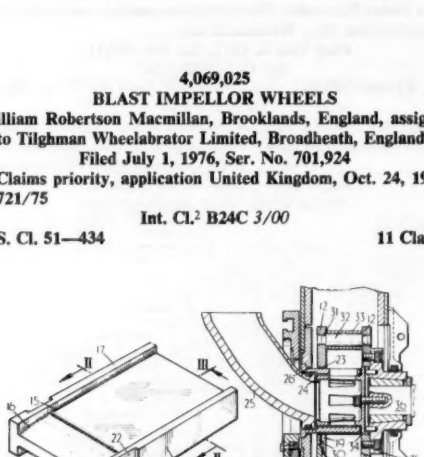
William Robertson Macmillan, Brooklands, England, assignor to Tilghman Wheelabrator Limited, Broadheath, England

Filed July 1, 1976, Ser. No. 701,924

Claims priority, application United Kingdom, Oct. 24, 1975, 43721/75

Int. Cl.² B24C *3/00*

U.S. Cl. 51—434 **11 Claims**



1. A blade for use in a blast impellor wheel, said blade being rectangular and having an I-configuration in transverse section, opposed ends, a pair of opposed faces each symmetrical about a longitudinal axis for use as an abrasive throwing face, and a pair of longitudinal side flanges, each of said side flanges being cut away adjacent one end of the blade to define in relief a protuberance of substantially triangular shape with a blunt nose pointing towards the other end of the blade such that upon engagement with a retaining ledge of a side plate of a blast impellor wheel, the cut away portion of each flange mitigating abrasive build-up therebetween.

4,069,026
FILTER MADE OF ELECTROSTATICALLY SPUN FIBRES

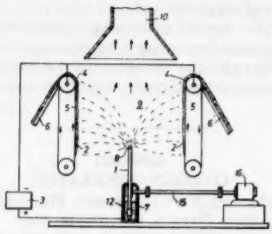
Walter Simm, Leverkusen; Claus Gösling, Opladen; Richard Bonart, Berlin, and Béla von Falkai, Gohr, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 155,189, June 21, 1971, abandoned. This application Nov. 15, 1973, Ser. No. 416,316

Claims priority, application Germany, June 29, 1970, 2032072

Int. Cl.² B03C *1/00*

U.S. Cl. 55—6 **12 Claims**



1. A fibre filter comprising a fibre fleece having an electrical charge produced by electrostatically spraying a solution of a polymer in a volatile solvent having a conductivity of 10^{-9} $Ohm^{-1}cm^{-1}$ to 10^{-4} $Ohm^{-1}cm^{-1}$ between an electrode wetted by the solution and a conductive support for spraying of the solution, evaporation of the solvent, and collection of the polymer as the fibre fleece on the support, the polymer being polycarbonate and the fibres of the fibre fleece having a porous surface structure, and a gas permeable support combined with the fibre fleece as support therefor.

12. Process of filtering dust particles from a gas which comprises passing the gas containing the dust particles through a fibre filter according to claim **1**.

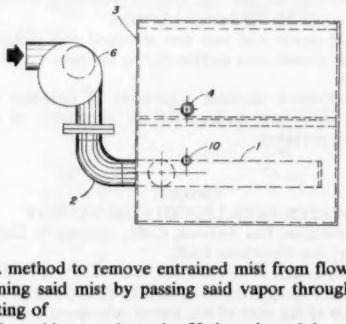
4,069,027
METHOD OF SEPARATING AN ENTRAINED MIST FROM A VAPOR

Charles Spurgeon Ward, Columbia, S.C., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed May 14, 1976, Ser. No. 686,430

Int. Cl.² B01D *47/02*

U.S. Cl. 55—95 **2 Claims**



1. A method to remove entrained mist from flowing vapor containing said mist by passing said vapor through a liquid, consisting of

passing said vapor through a U-shaped conduit positioned in said liquid and having slots cut therein,

facing downward from the surface of said liquid, said vapor entering said conduit near the center of the base of said U-shaped conduit, then

exiting said vapor from said slots through said liquid to remove said mist from said vapor, then

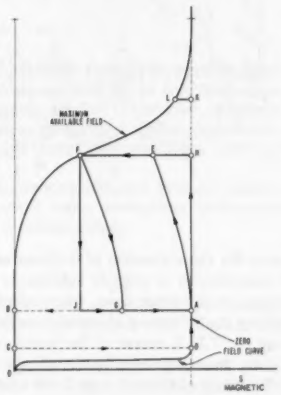
withdrawing said vapor overhead from said liquid, and

drawing off said liquid containing said removed mist, said liquid extending to a level 3 to 15 inches above said U-shaped conduit, and said slots being spaced at about ¼-inch to about 2-½-inch centers along said U-shaped conduit and having an axis normal to the axis of said U-shaped conduit.

4,069,028
MAGNETIC HEAT PUMPING

Gerald V. Brown, Lakewood, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 30, 1976, Ser. No. 746,580
Int. Cl.² F25B *21/02*
U.S. Cl. 62—3 **22 Claims**



1. A method of pumping heat for refrigeration or heating employing a ferromagnetic or ferrimagnetic element consisting essentially of a single material containing a rare-earth element and which method consists of

a. changing the element from a first to a second temperature while changing the magnetic field applied to said element from a first strength to a second strength, then

b. changing the element to a third temperature while changing the strength of said field to a third strength, then

c. changing the element to a fourth temperature while changing the strength of said field to a fourth strength, and then

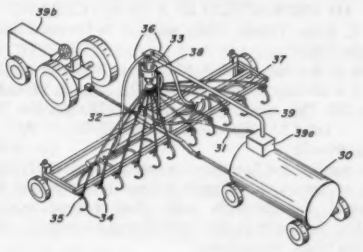
d. changing the temperature of said element back to said first temperature while changing the strength of said field back to said first strength.

4,069,029
PROCESS AND APPARATUS FOR PRODUCING AND USING COLD AMMONIA

John William Hudson, Atlanta, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 27, 1976, Ser. No. 726,704
Int. Cl.² F17C *7/02*
U.S. Cl. 62—51 **33 Claims**

1. A method for carrying out the substantially adiabatic expansion of a pressurized stream of ambient-temperature liquid ammmonia to produce a stream of cold liquid ammonia at substantially ambient or atmospheric pressure and a stream of cold gaseous ammonia at substantially ambient or atmospheric pressure, which comprises (1) introducing at a velocity of at least about 5000 feet per minute a stream of ambient-temperature, pressurized liquid ammonia into an expansion chamber, (2) imparting a high velocity spinning motion to the liquid ammonia entering the chamber such that rapid flow is produced around the interior of the chamber to thereby provide rapid separation of the liquid and gaseous ammonia in the chamber, and wherein the expansion chamber is provided with an outlet useful for the removal of gaseous ammonia therefrom which outlet is located above the path of liquid flow and another outlet useful for the removal of cold liquid ammonia therefrom, said outlets being provided at opposite ends of said expansion chamber, (3) directing the flow of the cold substantially ambient or atmospheric pressure liquid ammonia within said expansion chamber to said outlet useful for the withdrawal

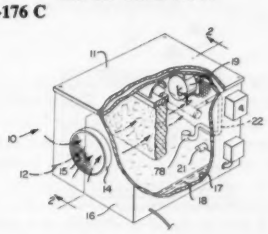


of cold ambient or atmospheric pressure liquid ammonia from said expansion chamber to effect separation between cold liquid ammonia and cold gaseous ammonia within said expansion chamber, and (4) withdrawing through said outlet useful for the removal of gaseous ammonia a stream of cold gaseous ammonia at substantially ambient or atmospheric pressure and a stream of cold liquid ammonia at substantially ambient or atmospheric pressure via said other outlet.

4,069,030
ENERGY CONSERVATION ENTHALPY CONTROL SYSTEM AND SENSOR THEREFOR

Grason T. Nickell, and Jack L. Alexander, Sr., both of Greensboro, N.C., assignors to Air Conditioning Corporation, Greensboro, N.C.

Filed Aug. 20, 1976, Ser. No. 716,231
Int. Cl.² F25D *17/04*
U.S. Cl. 62—176 C **18 Claims**



1. In combination, an apparatus for sensing the wet bulb temperature of sampled air passing therethrough ideally under adiabatic saturation conditions and providing a control signal representative of said wet bulb temperature comprising:

a housing which includes means for passing sampled air through said housing and sump means for collecting a body of water;

means cooperating with said housing for filtering said sampled air to remove physical contaminants from said sampled air;

mixing means for intimately mixing and contacting water from said sump means and said sampled air under conditions closely approximating adiabatic saturation;

means for recirculating said water, said recirculating means including a pump for pumping water from said sump means to said mixing means;

sensing means including a sensing element in said water in said sump means for sensing the temperature of said water when the temperature of said air and water are in equilib-

rium to provide an output representative of the wet bulb temperature of said sampled air;

transmitter means for transmitting a signal representing said wet bulb temperature; and

floating means for maintaining the water level in said housing.

4,069,031

PROCESS FOR FORMING TWO DIFFERENT INDICES OF REFRACTION IN A GLASS CERAMIC

James E. Rapp, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 684,615, May 10, 1976, Pat. No. 4,017,317, which is a division of Ser. No. 169,271, Aug. 5, 1971, Pat. No. 3,984,251. This application Nov. 30, 1976, Ser. No. 746,043

Int. Cl.² C03C *15/00*; C03B *25/00, 31/00*

U.S. Cl. 65—33 **6 Claims**

1. A method for forming a transparent glass-ceramic body having at least two different indices of refraction for light transmittal therethrough, said glass-ceramic body being formed by thermally in situ crystallizing a thermally crystallizable glass body, comprising:

a. heating a first portion of said glass body for a period of time and at a temperature sufficient to nucleate and crystallize said first portion of said glass body to a transparent glass-ceramic having a first index of refraction; and

b. heating a seoond and different portion of the same glass body for a period of time and at a temperature sufficient to nucleate and crystallize said second portion to a transparent glass-ceramic having a second index of refraction which is different from said first index of refraction.

4,069,032

FOREHEARTH FOR GLASS FURNACE

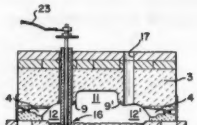
Jean Albert Brax, Chalon sur Saone, France, assignor to Societe Generale pour l'Emballage, Paris, France

Filed Feb. 25, 1977, Ser. No. 772,023

Claims priority, application France, May 4, 1976, 76 13261

Int. Cl.² C03B *5/02, 5/22*

U.S. Cl. 65—337 **9 Claims**



1. A forehearth for the conveyance of molten glass which comprises a trough and a roof over the trough, said roof having at least two longitudinal ridges extending downwardly from the roof and disposed substantially symmetrically on opposite sides of the vertical median plane of the trough to define in the space below the roof a central channel over the central portion of a stream of molten glass flowing through the trough and side channels on respective sides of the central channel over respective side portions of the stream of glass, longitudinally spaced inlet and outlet apertures in the roof over said central channel for the ingress and egress of a gaseous cooling fluid whereby the fluid flows over the central portion of the stream of molten glass in contact with the upper surface of the stream, the portion of said roof over said central channel between said apertures being substantially closed, and means disposed along the sides of said trough for applying heat to the side portions of the stream of glass, said means including a plurality of longitudinally spaced electrodes inserted in respective side portions of the molten stream of glass, said electrodes being suspended from the portions of the roof over said side channels, and means for energizing said electrodes to produce electric current flow through the molten glass in said side portions.

4,069,033

EXTRACTION OF FERTILIZER SALTS AND ORGANIC SUBSTANCES OF HIGH NUTRITIVE VALUE FROM INDUSTRIAL WASTE WATERS

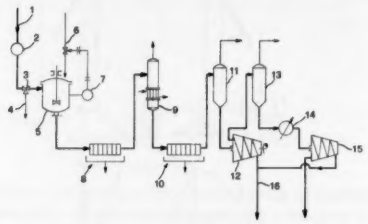
Paolo Baldassari, Reggio Emilia, Italy, assignor to Reggiane Officine Meccaniche Italiane S.p.A., Milan, Italy

Filed Sept. 19, 1975, Ser. No. 614,966

Claims priority, application Italy, Sept. 30, 1974, 3488/74

Int. Cl.² C05F *7/00*

U.S. Cl. 71—25 **8 Claims**



1. A process for the extraction of fertilizer salts, on the one hand, and concentrates of organic substances having a high nutritive value, on the other hand, from industrial waste waters, comprising the following successive steps:

monitoring the T.D.S. cntent of the waste water;

automatically diverting waste waters of high T.D.S. content to the following additional steps from waste water of low T.D.S. which does not undergo the following additional steps;

mixing the waste waters of high T.D.S. content with strong acids or bases, according to the composition of the waste water, in a quantity sufficient to form stable salts of low solubility;

filtering the formed mixture to eliminate insoluble substances or precipitates;

concentrating the filtrate by evaporation until the less soluble salts are saturated;

crystallizing the concentrated filtrate at least once;

separating the crystallized mineral salts, for use as fertilizer salts, from the mother liquor which is the concentrate of organic substances having high nutritive value.

4,069,034

SUSPENSION FERTILIZERS AND METHOD OF PRODUCING SAME

Lonnie Daniel Hoover, Chappell Hill, Tex., assignor to N L Industries, Inc., New York, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,129

Int. Cl.² C05B *7/00*

U.S. Cl. 71—33 **36 Claims**

1. In a method for producing a suspension fertilizer which includes saturating an aqueous phase with at least one phosphate containing fertilizer chemical and thereafter causing said saturated aqueous phase to become supersaturated from which phosphate crystals may be formed, the improvement which comprises adding before said aqueous phase becomes supersaturated between about 0.05% and about 3% by weight, based on the total weight of said suspension fertilizer of an alkali metal or ammonium salt, or mixtures thereof, of humic acid or a material which contains humic acid selected from the group consisting of leonardite, lignite, marine sediments, and mixtures thereof.

4,069,035
1-(2-CARBOXYARYL)-3-ARYL-1,2,4-TRIAZOLES AND USE AS HERBICIDES

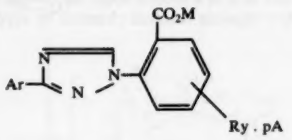
Alexander Lawrence Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 590,372, June 25, 1975. This application Sept. 10, 1976, Ser. No. 722,201

Int. Cl.[2] **A01N** *5/00, 9/22;* **C07D** *249/08, 401/04*

U.S. Cl. 71—76 **24 Claims**

1. A compound of the formula



in which

Ar is phenyl, naphthyl, biphenylyl, pyridyl, furyl, thienyl or phenyl substituted with up to two of fluorine, chlorine, bromine, iodine, alkyl of 1–5 carbons, methoxyl, trifluoromethyl, nitro, methylthio, trifluoromethoxyl, dimethylamino, cyano, acetyl, methylsulfonyl, carbamoyl or sulfamyl;

R is hydrogen, fluorine, chlorine, bromine, iodine, methoxyl, trifluoromethyl, nitro, methylthio, trifluoromethoxyl or alkyl of 1–5 carbon atoms;

p is 0 or 1;

y is 1 or 2;

A is an acid;

M is hydrogen, sodium, potassium, lithium, calcium or magnesium; with the proviso that when M is other than hydrogen, *p* is 0.

17. The process of regulating plant growth comprising the step of applying to the plant a plant growth retarding amount of a compound of claim **1**.

4,069,036
N-HALOACYL 4-SPIROCYCLOALIPHATIC OXAZOLIDINES

Kenneth P. Dorschner, Vienna, Va., and James A. Albright, St. Louis, Mich., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 280,836, Aug. 15, 1972, Pat. No. 3,859,292. This application Dec. 20, 1974, Ser. No. 534,824

Int. Cl.[2] **C07D** *263/04;* **A01N** *9/22*

U.S. Cl. 71—88 **22 Claims**

1. An N-haloalkanoyl 4-spirocycloaliphatic oxazolidine, wherein the haloalkanoyl group has 2 to 4 carbon atoms, the remaining oxazolidine ring-carbon atom valences are satisfied by hydrogen or C_{1-6} alkyl groups, and said spirocycloaliphatic group contains 5 to 12 carbon atoms and is selected from the group consisting of cyclopentyl, cyclohexyl, cyclohexenyl, cycloheptyl, cyclooctyl wherein said cycloaliphatic groups are unsubstituted or substituted with C_{1-6} lower alkyl groups.

7. An N-haloalkanoyl 4-spirocycloaliphatic oxazolidine dialkylated in the 2-position with C_{1-6} alkyl groups wherein the haloalkanoyl group contains 2 to 4 carbon atoms, the remaining oxazolidine ring-carbon atom valences are satisfied by hydrogen or C_{1-6} alkyl groups, and said spirocycloaliphatic group contains 5 to 12 carbon atoms and is selected from the group consisting of cyclopentyl, cyclohexyl, cyclohexenyl, cycloheptyl, cyclooctyl wherein said cycloaliphatic groups are unsubstituted or substituted with C_{1-6} lower alkyl groups.

11. A herbicidal composition comprising an agricultural carrier and an herbicidal amount of about 1-98% of an N-haloalkanoyl 4-spirocycloaliphatic oxazolidine, wherein the haloalkanoyl group has 2 to 4 carbon atoms, the remaining ring-carbon atom valences are satisfied with hydrogen atoms or C_{1-6} alkyl groups, and said spirocycloaliphatic group is cyclopentyl, cyclohexyl, cycloheptyl or cyclooctyl.

12. A process for protecting crop plants from undesirable growth of other unwanted vegetation which comprises applying to the locus thereof a herbicidal amount of a 4-spirocycloaliphatic N-haloalkanoyl oxazolidine wherein the haloalkanoyl group has 2 to 4 carbon atoms, the remaining ring-carbon atom valences are satisfied with hydrogen atoms or C_{1-6} alkyl groups, and said spirocycloaliphatic group contains 5 to 12 carbon atoms being selected from the group consisting of cyclopentyl, cyclohexyl, cyclohexenyl, cycloheptyl, cyclooctyl wherein said cycloaliphatic groups are unsubstituted or substituted with C_{1-6} lower alkyl groups.

4,069,037
SELECTIVE HERBICIDE FOR PINEAPPLE CROPS

Arlyn Wayne Evans, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1976, Ser. No. 736,453

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 71—93 **5 Claims**

1. Method for preventing and controlling undesired vegetation in pineapple crops without causing significant injury to said crop comprising applying to the locus of said crop an effective amount of 1-methyl-3-cyclohexyl-6-dimethylamino-s-triazine-2,4(1H,3H)-dione.

4,069,038
ACYCLIC AND ALICYCLIC N-SUBSTITUTED HALO-2-PYRROLIDINONES AND THEIR UTILITY AS HERBICIDES

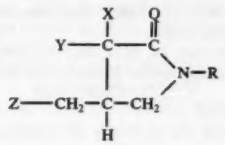
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 563,280, March 28, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,962

Int. Cl.[2] **A01N** *9/22, 9/12;* **C07D** *207/24, 207/26*

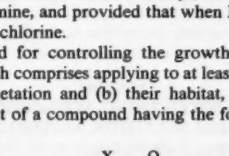
U.S. Cl. 71—95 **56 Claims**

1. A compound having the formula



in which Q is oxygen or sulfur; R is lower alkyl containing from 1 to 6 carbon atoms, inclusive, alkenyl containing from 3 to 6 carbon atoms, inclusive, haloalkyl having 1 to 6 carbon atoms, inclusive, and having one or more halogen substitutions, cycloalkyl having from 3 to 7 carbon atoms, inclusive, cycloalkylalkyl having a total carbon content of from 4 to 8 carbon atoms, inclusive, benzyl and chlorobenzyl; X is hydrogen or chlorine; Y is chlorine or bromine, and Z is chlorine or bromine; provided that when R is allyl, Y and Z are each chlorine or bromine, and provided that when R is cyclohexyl, X is other than chlorine.

30. A method for controlling the growth of undesirable vegetation which comprises applying to at least one of (a) such undesirable vegetation and (b) their habitat, an herbicidally effective amount of a compound having the formula



in which Q is oxygen or sulfur; R is lower alkyl containing from 1 to 6 carbon atoms, inclusive, alkenyl containing from 3 to 6 carbon atoms, inclusive, haloalkyl having 1 to 6 carbon atoms, inclusive, and having one or more halogen substitutions,

cycloalkyl having from 3 to 7 carbon atoms, inclusive, cycloalkylalkyl having a total carbon content of from 4 to 8 carbon atoms, inclusive, benzyl and chlorobenzyl; X is hydrogen or chlorine; Y is chlorine or bromine, and Z is chlorine or bromine; provided that when R is allyl, Y and Z are each chlorine or bromine, and provided that when R is cyclohexyl, X is other than chlorine.

4,069,039

METHOD FOR DESULFURIZATION USING ARC HEAT UNDER VACUUM

Albert L. Lehman, Mount Prospect, Ill., assignor to A. Finkl & Sons Co., Chicago, Ill.

Filed June 23, 1976, Ser. No. 699,072
Int. Cl.[2] C21C *5/52, 7/10, 7/06*
U.S. Cl. 75—12 **15 Claims**

1. In a method of desulfurizing a molten steel bath to 0.006 and below, the steps of

establishing a hot, fluidized, highly basic slag in contact with the molten steel to be desulfurized,

lowering the oxygen potential of the molten steel,

establishing a bath temperature conducive to progression of desulfurization, and

after establishment of the above system conditions,

subjecting the molten steel, while subject to the aforementioned system conditions, to a violent agitation in a vacuum for a period of a total of at least about ten minutes,

said agitation being sufficiently violent to cause metal droplets to be impelled upwardly into the space above the surface of the molten steel, and to pass through the slag upon return to the steel.

4,069,040

METHOD FOR RECOVERY OF PLATINUM AND IRIDIUM FROM CATALYSTS

Maryvonne Thomas, Boulogne Billancourt, and Jean Grosbois, L'Isle Adam, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 18, 1974, Ser. No. 524,777
Claims priority, application France, Nov. 19, 1973, 73.41076
Int. Cl.[2] C22B *11/04*
U.S. Cl. 75—101 BE **12 Claims**

1. A method for the recovery of constituents of catalysts containing platinum and iridium on an aluminous support, comprising the steps of

a. attacking the catalyst with a 3–9 M hydrochloric acid solution to dissolve alumina, platinum and iridium,

b. adding to the solution a sufficient quantity of reducing agent to convert dissolved iridium to the trivalent state,

c. passing the solution into contact with an anion exchange medium on which platinum becomes strongly fixed leaving alumina and iridium in solution,

d. adding an oxidizing agent to the solution from (c) to convert trivalent iridium to the tetravalent state,

e. passing the solution into contact with an anion exchange medium on which the iridium becomes strongly fixed.

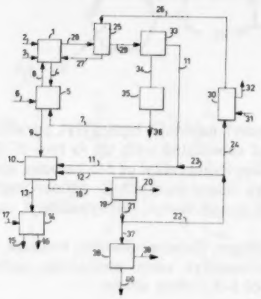
4,069,041

METHOD OF RECOVERING NON-FERROUS METALS FROM SULPHIDIC MATERIALS

Karl Göran Görling, Lidingo; Ingvar A. O. Edenwall, Helsingborg; Jan-Olof Jansson, and Thomas K. Mîöen, both of Stockholm, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed June 24, 1976, Ser. No. 699,323
Claims priority, application Sweden, July 1, 1975, 7507507
Int. Cl.[2] C22B *15/00*
U.S. Cl. 75—101 R **19 Claims**

1. In a method for recovering copper and/or other non-ferrous metals including precious metals, from iron-containing sulphidic raw material comprising copper and/or other non-ferrous metals, wherein the starting material is first subjected to a sulphatizing treatment so as to convert at least one of the non-ferrous metals into the form of a readily soluble sulphate and/or basic sulphate, whereafter said at least one non-ferrous metal in a leaching stage is leached out with an aqueous sulphuric acid solution, the major quantity of the leached metal or metals then being recovered from the leaching solution formed and wherein remaining non-ferrous metals in the leaching residue formed is optionally recovered by further process stages, the improvement which comprises carrying out the sulphatizing treatment process in two stages, the material being in a first stage roasted in a roasting furnace to a substantially sulphur-free state and then in a second stage the roasted material being treated in a separate reaction chamber by supplying



sulphatizing agent thereto, the second stage treatment being effected under such conditions as to permit substantial forming of compounds comprising sulphates, basic sulphates or mixtures thereof of said at least one non-ferrous metal, feeding a first portion of the residual solution obtained subsequent to recovering non-ferrous metal content from the leaching solution to the leaching stage, the magnitude of said first portion being selected to effect said leaching and returning a second portion of said residual solution to the roasting furnace, where the sulphur content of said second portion of the solution is converted into sulphur dioxide and passed to the gases formed by the roasting.

4,069,042

METHOD OF PRESSING AND FORGING METAL POWDER

Kalman E. Buchovecky, Oakmont, and Milton R. Rearick, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1975, Ser. No. 638,948
Int. Cl.[2] B22F *3/00*
U.S. Cl. 75—208 R **12 Claims**

1. A method for forging metal powders of aluminum and its alloys comprises:

placing in an open-ended readily deformable metal container an amount of loose powder, said container having a general shape of an article to be forged, and the amount of said powder being more than sufficient metal needed to forge the article to a predetermined density;

heating said powder within said container to a substantially uniform temperature below the melting point of the powder but at least 600° F to facilitate metallurgical bonding of said powder during conditions of plastic deformation;

maintaining over the open-end of said container during heating a cover sufficient to contain the powder and to allow for escape of gases evolved from heating the powder within said container but to retain in said container a sufficient portion of said gases to effectively shield the powder and provide an oxidation protective atmosphere; and

forging said container with said powder therein into a forged shape of the article having a predetermined density of at least 99% by compressing within substantially closed dies

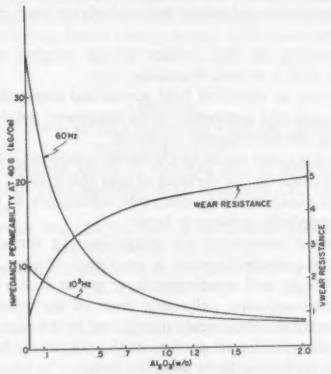
and effecting plastic flow of the metal, the dies having provision for escape of excess metal.

4,069,043

WEAR-RESISTANT SHAPED MAGNETIC ARTICLE AND PROCESS FOR MAKING THE SAME

Friedrich W. Ackermann, Wyomissing, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Jan. 19, 1976, Ser. No. 650,259
Int. Cl.[2] B22F *3/00*
U.S. Cl. 75—232 **29 Claims**



1. A ferromagnetically soft wear-resistant shaped article made from metal powder in which a refractory oxide powder is substantially uniformly dispersed therein having a minimum particle size greater than about 1 micron which is large compared to the Block wall thickness in the composition of said article, the composition of said article consisting essentially of about

	Weight Percent
Carbon	<0.025
Manganese	0–2
Nickel	70–85
Chromium	0–5
Molybdenum	0–6
Copper	0–6
Titanium	0–1
Niobium	0–1
Refractory oxide	0.1–2.0

the balance being essentially iron and incidental impurities with the iron content being greater than 10%, said article having a density at least 99% of theoretical with residual voids being larger than the Block wall thickness.

15. A process for making a ferromagnetically soft wear-resistant shaped article which includes the steps of blending metal powder and a refractory oxide powder having a minimum particle size greater than about 1 micron that is large compared to the Bloch wall thickness in the composition of said article to provide a substantially homogeneous mixture in such proportions that the composition of the article in its sintered and densified condition in weight percent consists essentially of about

	Weight Percent
Carbon	<0.025
Manganese	0–2
Nickel	70–85
Chromium	0–5
Molybdenum	0–6
Copper	0–6
Titanium	0–1
Niobium	0–1

-continued

	Weight Percent
Refractory oxide	0.1–2.0

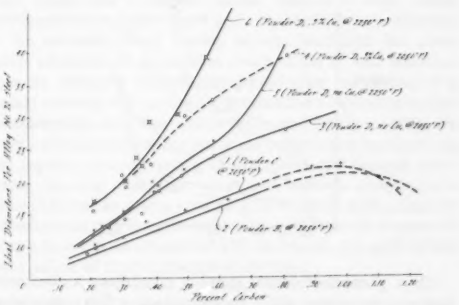
the balance being essentially iron and incidental impurities with the iron content being greater than 10%, then forming a preliminary shape from the blended powders, sintering the preliminary shape at a high enough temperature and for a long enough time in a reducing or inert atmosphere to provide a substantial amount of densification without reducing or melting the refractory oxide, and then working the sintered shape and reducing the thickness thereof to provide a shaped article having at least 99% theoretical density and in which the metal elements present except that combined to form refractory oxide are fully alloyed and homogeneously distributed.

4,069,044

METHOD OF PRODUCING A FORGED ARTICLE FROM PREALLOYED-PREMIXED WATER ATOMIZED FERROUS ALLOY POWDER

Stanislaw Mocarski, 3661 Rockwell, Windsor, Ontario N9E 2B1, Canada, and Daniel W. Hall, 25487 Kennedy, Dearborn Heights, Mich. 48127

Division of Ser. No. 691,914, Aug. 6, 1976. This application Feb. 3, 1977, Ser. No. 765,334
Int. Cl.[2] B22D *23/08*; B22F *1/00*
U.S. Cl. 75—243 **4 Claims**



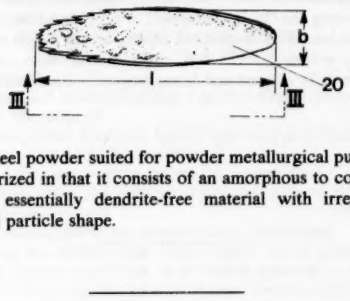
1. A prealloyed ferrous-based powder useful for promoting optimum hardenability when exposed to copper and carbon during sintering, said powder having a mesh size of −80, each particle of said powder being characterized by a substantially irregular spherical configuration consisting of a steel alloy having 0.4–0.65% by weight of molybdenum with or without nickel addition, the remainder being substantially iron, said molybdenum and/or nickel being distributed throughout each of said particles to form an alloy phase at the outer region of each particle which is richer in molybdenum and/or nickel, said powder having an oxygen content no greater than 0.25%, and a carbon content less than 0.04%.

4,069,045

METAL POWDER SUITED FOR POWDER METALLURGICAL PURPOSES, AND A PROCESS FOR MANUFACTURING THE METAL POWDER

Bengt G. S. Lundgren, Ulricehamn, Sweden, assignor to SKF Nova AB, Gathenburg, Sweden

Continuation-in-part of Ser. No. 634,343, Nov. 24, 1975, abandoned. This application May 17, 1976, Ser. No. 686,937
Claims priority, application Sweden, Nov. 26, 1974, 7414811
Int. Cl.[2] B22D *23/08*
U.S. Cl. 75—251 10 Claims



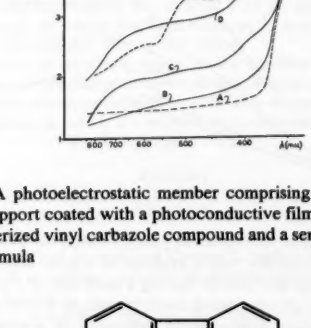
1. A steel powder suited for powder metallurgical purposes, characterized in that it consists of an amorphous to compact-grained, essentially dendrite-free material with irregularly cornered particle shape.

4,069,046

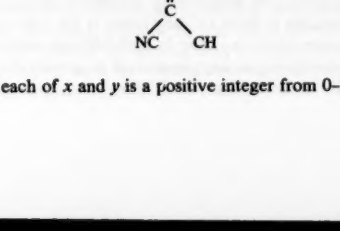
POLYMERIZED VINYL CARBAZOLES SENSITIZED BY NITRO-SUBSTITUTED 9-DICYANOMETHYLENE FLUORENES

Helmut Hoegl, Grand-Lancy, Geneva, and Giacomo Barchietto, Cointrin, Geneva, both of Switzerland, assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 116,989, Feb. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 652,278, July 10, 1967, abandoned. This application Jan. 29, 1974, Ser. No. 437,573
Int. Cl.[2] G03Q *5/06, 13/22*
U.S. Cl. 96—1 PC 22 Claims



13. A photoelectrostatic member comprising a conductive base support coated with a photoconductive film comprising a polymerized vinyl carbazole compound and a sensitizer having the formula



wherein each of x and y is a positive integer from 0–2.

4,069,047

TRANSFER OF PHOTOELECTROPHORETIC IMAGES

Luke C. Lin, Rochester, and Morton Schrager, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 27, 1975, Ser. No. 591,182
Int. Cl.[2] G03Q *13/24*
U.S. Cl. 96—1.4 14 Claims

1. A photoelectrophoretic imaging method comprising the steps of

a. providing a layer of an imaging suspension comprising electrically photosensitive pigment particles in an electrically insulating carrier liquid on the surface of a transparent injecting electrode comprising a substrate carrying a thermoplastic polymeric layer which carries a conductive layer;
b. contacting the free surface of said imaging suspension layer with a second electrode;
c. applying an electrical field across said suspension layer;
d. exposing said suspension to an imagewise pattern of activating electromagnetic radiation;
e. separating said electrodes wherein complementary images are formed on the surfaces of said electrodes;
f. heating said injecting electrode sufficiently to soften the thermoplastic polymeric layer;
g. pressure contacting the image bearing surface of said injecting electrode with a receiving member, whereby said image, said conductive layer and at least a portion of the thermoplastic polymeric layer of the injecting electrode are simultaneously transferred to the receiver member, the transferred portion of the polymeric layer forming a protective layer over the image.

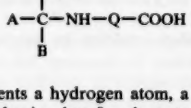
4,069,048

DIFFUSION TRANSFER PHOTOGRAPHIC MATERIALS WITH COLOR DEVELOPER SCAVENGER

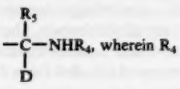
Motohiko Tsubota; Sosuke Hanai; Yasushi Oishi; Hidefumi Sera, and Nobuo Yamamoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 17, 1976, Ser. No. 658,939
Claims priority, application Japan, Feb. 17, 1975, 50-19554
Int. Cl.[2] G03C *7/00, 5/54, 1/40, 1/76*
U.S. Cl. 96—3 38 Claims

1. In a diffusion transfer color photographic material including a photosensitive element comprising at least one silver halide emulsion layer having associated therewith a non-diffusible dye image forming material, an image-receiving element which fixes a diffusible dye formed from said dye image forming material by the oxidative reaction thereof with a primary aromatic amino color developing agent to form a dye image, and a liquid processing composition for developing the exposed photosensitive element and transferring the dye image formed into the image receiving element, the improvement which comprises including in the photosensitive element, the image receiving element, or the liquid processing composition at least one N-α-sulfoalkylated amino acid represented by the following general formula:



wherein A represents a hydrogen atom, a hydroxy group, a lower alkyl group having 1 to 5 carbon atoms, an alkyl group having 1 to 5 carbon atoms substituted with a hydroxy group or lower alkoxy group, an alicyclic hydrocarbon group, an aryl group or an aryl group substituted by a lower alkyl group, nitro group, cyano group, alkoxy group, sulfo group, allyloxy group, halogen atom, acyloxy group or alkoxycarbonyl group, B represents a hydrogen atom or the group



represents a hydrogen atom, an alkyl group, an aryl group, an aryl group substituted with a sulfo group or carboxy group, R_5 represents a hydrogen atom or a lower alkyl group, and D represents a hydrogen atom or a sulfo group, and Q represents a methylene group, a methylene group substituted with a lower alkyl group, hydroxyalkyl group, lower alkoxyalkyl group, aralkyl group, or aryl group, a phenylene group, and a phenylene group substituted with a lower alkyl group, halogen atom, nitro group, lower alkoxy group, sulfo group or carboxy group.

4,069,049

PROCESS FOR RECORDING HOLOGRAPHIC INFORMATION

Shymon Reich, and Albert A. Friesem, both of Rehovot, Israel, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Division of Ser. No. 628,752, Nov. 4, 1975. This application Apr. 15, 1976, Ser. No. 677,213

Claims priority, application Israel, Dec. 2, 1974, 46164

Int. Cl.[2] G03C *5/04*

U.S. Cl. 96—27 H **10 Claims**

1. A process for recording spatially modulated data and for the recording of holographic information in situ and in real time by means of a device adapted to record a hologram on a recording medium, comprising means for effecting an exposure of said recording medium with an information beam from an object illuminated with spatially coherent electromagnetic waves and means for simultaneously exposing said recording medium to a reference beam of said spatially coherent electromagnetic waves to produce on said recording medium a hologram interference pattern between said information beam and said reference beam, said recording medium consisting of a polymeric layer of from some microns thickness to a few millimeters thickness of a lower-alkyl 2-cyanoacrylate containing p-benzoquinone as photosensitizer, said process comprising:

exposing said recording medium with an information beam from an object illuminated with spatially coherent electromagnetic waves; and

simultaneously exposing said recording medium to a reference beam of said spatially coherent electromagnetic waves to produce on said recording medium a hologram interference pattern between said information beam and said reference beam.

4,069,050

IMAGE FORMING PROCESS

Hiroshi Hara, and Hideyuki Kusaba, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 11, 1976, Ser. No. 713,552

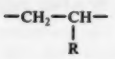
Claims priority, application Japan, Aug. 11, 1975, 50-97250

Int. Cl.[2] G03C *5/32, 7/16*

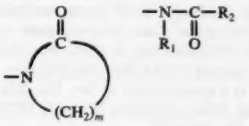
U.S. Cl. 96—60 R **27 Claims**

1. In a process involving image formation followed by photographic processing which comprises contacting an imagewise exposed color photographic element comprising a support having thereon at least one silver halide emulsion containing image-wise distributed silver catalyst nuclei with an intensifier containing at least one intensifying agent selected from the group consisting of peroxides, halogenous acids and cobalt (III) complex compounds, in the presence of a reducing agent, which is in a processing solution or the element, and thereby image-wise oxidizing the reducing agent and conducting image intensification by the oxidized reducing agent, the improvement comprising that (1) at least one compound represented by the following general formula having a polymerization degree of 1 — 8,000; $-(A)_x-(B)_y-$

wherein A represents



or $-CH_2-CH_2-O-$, wherein R represents



or —OH, with *m* being an integer of 3 - 7, R_1 is an alkyl group having 1 to 6 carbon atoms, and R_2 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms,

B represents a monomer unit derived from styrene, methacrylic acid ester, acrylic acid ester, vinyl acetate, acrylonitrile, vinyl alcohol, vinyl chloride, vinyl ether, acrylamide, N,N-dimethylacrylamide, acrylic acid, methacrylic acid, maleic acid, potassium styrenesulfonate, N,N-dialkylaminoalkyl methacrylate, vinyl imidazole or vinyl pyridine, and (2) an antifoggant being at least one nitrogen containing hetero ring compound having no mercapto group are both contained in said intensifier or a developing bath prior to said intensifier.

4,069,051

SILVER HALIDE PHOTOSENSITIVE ELEMENT SENSITIZED WITH AN INORGANIC BISMUTH COMPOUND AND THE USE THEREOF

Akira Horikoshi; Kenro Sakamoto; Toshihiko Koike; Yosuke Sadahiro, and Toyohiko Kato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1976, Ser. No. 680,513

Claims priority, application Japan, Apr. 30, 1975, 50-52179

Int. Cl.[2] G03C *5/30, 1/28, 1/76*

U.S. Cl. 96—66 R **8 Claims**

1. A developing-out type silver halide photosensitive element comprising a support having thereon a silver halide photosensitive emulsion layer and a constitutive layer adjacent to the emulsion layer, having incorporated into the silver halide photosensitive emulsion composition of said emulsion layer an inorganic bismuth compound after completion of a second ripening step during the preparation of the silver halide photosensitive emulsion composition, and before coating the silver halide photosensitive emulsion composition as a layer on said support, and/or having incorporated said bismuth compound into the constitute layer, said bismuth compound is selected from the group consisting of bismuth oxide, bismuth oxide hydrate and bismuth hydroxide, said bismuth compound being present in an amount of 0.05 to 5 moles per mole of the silver halide of the photosensitve element.

4,069,052

COLOR PHOTOGRAPHIC MATERIALS WITH SPIRO HETEROCYCLIC STABILIZING AGENTS COMPRISING 2-IMIDAZOLIDINE-4',5'-DIONE RINGS

Karl Lohmer; Anita von König, both of Leverkusen; Siegismund Schutz, Metzkausen, and Jürgen Stoltefuss, Haan, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 15, 1975, Ser. No. 640,641

Claims priority, application Germany, Dec. 20, 1974, 2460330

Int. Cl.[2] G03C *1/48, 1/34, 7/00, 1/40*

U.S. Cl. 96—76 R **7 Claims**

1. In a photographic material containing at least one silver

halide emulsion layer and a support and a stabilizer compound the improvement according to which the stabilizer compound is a phenyl compound in which the phenyl ring is ortho disubstituted with oxygen, sulfur or —NH— as bridging members being linked together to form a spiro structure with 2'-imidazolidine-4',5'-dione.

4,069,053
PHOTOGRAPHIC FILMS

Masayoshi Mayama, Hachioji; Tohru Kobayashi, Tachikawa, and Masahide Tamura, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 547,884, Feb. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 444,663, Feb. 21, 1974, abandoned, which is a continuation of Ser. No. 232,193, March 6, 1972, abandoned. This application Mar. 31, 1977, Ser. No. 783,443

Claims priority, application Japan, Mar. 18, 1971, 46-14727

Int. Cl.[2] G03C *1/98, 1/02*

U.S. Cl. 96—87 A **9 Claims**

1. In a photographic film having a plastic support; a first layer comprising cellulose acetate and a matting agent comprising silicon dioxide less than 1μ in particle size; a second layer comprising a phosphoric acid ester of a C_8 to C_{22}-higher alkyl alcohol, or an amine salt thereof, said first and second layers being carried in that order on one side of the support; and a light-sensitive emulsion layer on the other side of the support.

4,069,054
PHOTOPOLYMERIZABLE COMPOSITION CONTAINING A SENSITIZED AROMATIC SULFONIUM COMPOUND AND A CATIONACALLY POLYMERIZABLE MONOMER

George H. Smith, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 2, 1975, Ser. No. 609,896

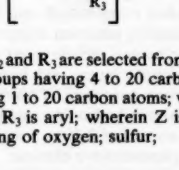
Int. Cl.[2] G03C *1/68*

U.S. Cl. 96—115 P **3 Claims**

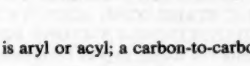
1. A photopolymerizable composition comprising:

a. a cationically polymerizable monomer;

b. an aromatic sulfonium compound of the following forumula:



wherein R_1, R_2 and R_3 are selected from the group consisting of aryl groups having 4 to 20 carbon atoms and alkyl radicals having 1 to 20 carbon atoms; wherein at least one of R_1, R_2 and R_3 is aryl; wherein Z is selected from the group consisting of oxygen; sulfur;

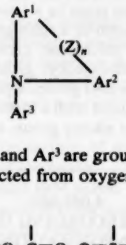


where R is aryl or acyl; a carbon-to-carbon bond; or

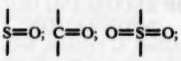
where R_4 and R_5 are selected from the group consisting of hydrogen, an alkyl radical having 1 to 4 carbon atoms, and an alkenyl radical having 2 to 4 carbon atoms; and n is zero or 1; and X— is a halogen-containing complex anion selected from tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, and hexafluoroantimonate; and

c. a sensitizing compound selected from the group consisting of:

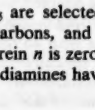
i. aromatic tertiary amines having the formula



where Ar^1, Ar^2 and Ar^3 are groups having 6–20 carbon atoms; Z is selected from oxygen; sulfur;

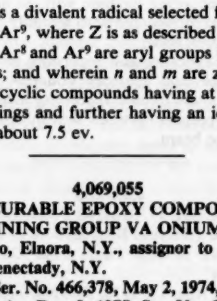


a carbon-to-carbon bond; or



where R_4 and R_5 are selected from hydrogen, alkyl radicals of 1–4 carbons, and alkenyl radicals of 2-4 carbons, and wherein n is zero or 1;

ii. aromatic tertiary diamines having the formula



where Y is a divalent radical selected from arylene and Ar^8—Z—Ar^9, where Z is as described above; Ar^4, Ar^5, Ar^6, Ar^7, Ar^8 and Ar^9 are aryl groups having 6–20 carbon atoms; and wherein n and m are zero or 1; and

iii. aryl polycyclic compounds having at least three fused benzene rings and further having an ionization energy less than about 7.5 ev.

4,069,055
PHOTOCURABLE EPOXY COMPOSITIONS CONTAINING GROUP VA ONIUM SALTS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 466,378, May 2, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 638,994

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] G03C *1/68;* **C09D** *11/00;* **C08F** *2/46, 8/18*

U.S. Cl. 96—115 R **18 Claims**

1. Photocurable compositions consisting essentially of

A. an epoxy resin polymerizable to a higher molecular weight state, and

B. an effective amount of a photodecomposable aromatic onium salt of a Group Va element capable of effecting the cure of (A) when exposed to radiant energy where the photodecomposable aromatic onium salt of a Group Va element has the formula,

$$[(R)_a(R^1)_b(R^2)_cX]^+_d[MQ_e]^{-(e-f)},$$

where R is a monovalent aromatic organic radical selected from carbocyclic radicals and heterocyclic radicals, R^1 is a monovalent organic aliphatic radical selected from alkyl, alkoxy, cycloalkyl and substituted derivatives thereof, R^2 is a polyvalent organic radical forming an aromatic heterocyclic or fused ring structure with X, X is a Group Va element selected from N, P, As, Sb and Bi, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 4 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 to 2 inclusive, and the sum of $a + b + c$ is a value equal to 4 or the valence of X,

$d = e - f$

f = valence of M and is an integer equal to from 2 to 7 inclusive

e is $> f$ and is an integer having a value up to 8.

4,069,056

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING GROUP VA AROMATIC ONIUM SALTS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 466,376, May 2, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 638,993

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] G03C *1/68*; C08F *8/18, 2/46, 4/00*

U.S. Cl. 96—115 P **10 Claims**

1. Cationically polymerizable compositions consisting essentially of

A. a monomeric or prepolymeric cationically polymerizable organic material free of oxirane oxygen selected from vinyl organic monomers, vinyl organic prepolymers, vinyl organic esters, cyclic organic amines, cyclic organo sulfides, organosilicon cyclics, and cyclic amines, and

B. from 0.1% to 15% by weight based on the weight of polymerizable composition of a photodecomposable aromatic onium salt of a Group Va element capable of effecting the cationic polymerization of (A) when exposed to radiant energy having the formula,

$$[(R)_a(R^1)_b(R^2)_c X]_d^+ [MQ_e]^{-(e-f)},$$

where R is a monovalent aromatic organic radical selected from carbocyclic radicals and heterocyclic radicals, R^1 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted derivatives thereof, R^2 is a polyvalent organic radical forming an aromatic heterocyclic or fused ring structure with X, X is a Group Va element selected from N, P, As, Sb and Bi, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 4 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 to 2 inclusive, and the sum of $a + b + c$ is a value equal to 4 or the valence of X,

$d = e - f$

f = valence of M and is an integer equal to from 2 to 7 inclusive

3 is $> f$ and is an integer having a value up to 8.

4,069,057

MONOLITHIC REFRACTORY MATERIALS

Siro Kamei, Mitaka; Kenzo Takeda, Toyonaka; Mitsunao Takahashi, Hirakata, and Jiro Nakano, Settsu, all of Japan, assignors to Nippon Crucible Co., Ltd., Tokyo; Teikoku Kako Co., Ltd., Osaka and Nippon Steel Corporation, Tokyo, all of, Japan

Filed Feb. 17, 1976, Ser. No. 658,781

Claims priority, application Japan, Feb. 15, 1975, 50-19327

Int. Cl.[2] C04B *35/14, 35/52, 35/58, 35/66*

U.S. Cl. 106—55 **5 Claims**

1. In a monolithic refractory material comprising

a. a refractory composition consisting of a powdery refractory component which does not react with silica sol or alumina sol at room temperature; and

b. a binder having a solids content of more than about 5% by weight selected from the group consisting of silica sol, alumina sol or a mixture thereof; the improvement which comprises said material being a thixotropic monolithic refractory material for vibration forming which consists essentially of

i. 100 parts by weight of said powdery refractory component;

ii. from about 5 to 20 parts by weight of said binder; and

iii. from about 0.3 to 3.0 parts by weight of a water-insoluble or slightly water-soluble metal phosphate synthesized at a temperature of from about 230° to about 500° C.

4,069,058

POROUS SILICON OXYNITRIDE REFRACTORY SHAPES

Malcolm E. Washburn, Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 599,387, July 28, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,357

Int. Cl.[2] C04B *35/58*

U.S. Cl. 106—55 **9 Claims**

1. A permeable refractory body consisting of a refractory grain having a mesh size of from 4 to 90, and a silicon oxynitride bond therefor, said body having a porosity, as represented by the ratio of flow rate "F" to pressure drop "P" of F/P of at least about 0.3, where F is measured in cubic feet per hour per inch^2, and P is measured in inches of water per inch of thickness of said body, the pores of said body being essentially free of silicon nitride whiskers.

4,069,059

SILICON NITRIDE-ZIRCONIUM SILICATE CERAMICS

William J. McDonough, and Roy W. Rice, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington DC

Filed June 11, 1976, Ser. No. 695,296

Int. Cl.[2] C04B *35/58*

U.S. Cl. 106—57 **1 Claim**

1. A dense and high-temperature-oxidation-resistant ceramic prepared from a mixture consisting of silicon nitride and of zirconium silicate in an amount from 3 to 15 weight percent of said silicon nitride.

4,069,060

ALUMINA-SILICON CARBIDE REFRACTORIES AND THEIR METHOD OF MANUFACTURE

Takeshi Hayashi, Bizen, and Masao Shibuno, Okayama, both of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 615,094

Claims priority, application Japan, Oct. 7, 1974, 49-114731

Int. Cl.[2] C04B *35/02, 35/52, 35/00*; F37B *9/04*

U.S. Cl. 106—65 **13 Claims**

1. A process for manufacturing alumina-silicon carbide type refractories having a bonding structure which comprises mixing a silica-alumina type refractory material with a metallic aluminum powder, molding the mixture, drying the molded mixture, and then firing it in an atmosphere containing predominantly a carbon oxide gas, whereby the silica contained in the silica-alumina refractory material is reduced with the metallic aluminum powder to form metallic silicon and simultaneously corundum and also said metallic silicon is carbonized with the carbon oxide gas to form silicon carbide, so that an inter growth texture comprising corundum and silicon carbide is formed in a portion of the bonding structure of the refractories.

4,069,061
CERAMICS HAVING NONLINEAR VOLTAGE CHARACTERISTICS

Ikuo Nagasawa; Kazuo Mukae; Takashi Ishii, and Koichi Tsuda, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed June 30, 1976, Ser. No. 701,279
Claims priority, application Japan, June 30, 1975, 50-80594; June 30, 1975, 50-80595
Int. Cl.[2] C04B *35/50;* H01C *7/10, 7/12*
U.S. Cl. 106—73.2 **4 Claims**

1. Ceramic compositions consisting essentially of (1) from about 0.08 to about 10.0 atomic % Pr; (2) from about 0.08 to about 10.0 atomic % Mg or from about 0.08 to about 10.0 atomic % Ca; (3) from about 0.1 to about 8.0 atomic % Co; balance ZnO.

4,069,062
ADDITIVE FOR MORTAR AND CONCRETE

Theodor Bürge, Geroldswil, Switzerland, assignor to Sika AG, Vormals Kaspar Winkler & Co., Zurich, Switzerland

Division of Ser. No. 636,930, Dec. 2, 1975, which is a continuation of Ser. No. 465,883, May 1, 1974, abandoned. This application Oct. 28, 1976, Ser. No. 736,423
Claims priority, application Australia, May 8, 1973, 4023/73
Int. Cl.[2] C04B *7/353*
U.S. Cl. 106—93 **13 Claims**

1. In a process for improving mortar or concrete in which a water-soluble, swellable polymeric substance is incorporated into the mortar or concrete in order to increase the viscosity thereof, the improvement which comprises separately preparing an aqueous dispersion in which the unswollen, water-soluble, swellable polymeric substance is finely dispersed in an aqueous solution of a water-soluble salt or an organic solvent in which said substance is only partially soluble or insoluble, wherein the salt or organic solvent serves to prevent dissolution and swelling of the polymeric substance, said separately prepared aqueous dispersion having a low viscosity and being storage stable, and as needed mixing this separately prepared storage stable, low-viscosity dispersion into the mortar or concrete where the water-soluble, swellable polymeric substance is freed to swell and thereby increase the viscosity of the mortar or concrete.

4,069,063
CEMENT COMPOSITION

Frank J. Ball, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,526
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—97 **17 Claims**

1. A portland cement mix comprising, a ground portland cement with or without added gypsum, aggregate, sufficient water to effect hydraulic setting of the cement, and having added thereto carbon dioxide in an amount sufficient to control setting of the mix and stabilize the hydrated cement.

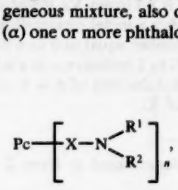
4,069,064
PHTHALOCYANINE FORMULATIONS HAVING HIGH GLOSS, WHICH ARE STABILIZED AGAINST RECRYSTALLIZATION AND AGAINST CHANGE OF MODIFICATION

Robert Nett, Neustadt; Wolf Dieter Fechner, Dirmstein; Werner Jettmar, Mannheim; Rudolf Polster, Frankenthal; Reinhard Sappok, Heidelberg, and Eduard Hartmann, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

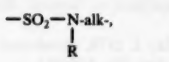
Filed Mar. 24, 1976, Ser. No. 669,842
Claims priority, application Germany, Apr. 12, 1975, 2516054
Int. Cl.[2] C09B *47/04*
U.S. Cl. 106—193 P **14 Claims**

1. A finely divided solid to pasty phthalocyanine formulation which is stable against recrystallization and change of modification, which gives colorations having good gloss, and which consists essentially of

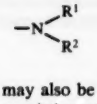
a. a finely divided phthalocyanine dispersed in insoluble form as the pigment and (b) from 10 to 40 percent by weight, based on (a), of a salt or the corresponding homogeneous mixture, also dispersed in insoluble form, of (α) one or more phthalocyanine derivatives of the formula



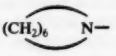
where Pc is an n-valent radical of the metal-free phthalocyanine, of a copper phthalocyanine or of a mixture of these, X is $-CH_2-$,



$-CH_2-CH_2-COO-C_2H_4-$ or $-CH_2-CH_2-COO-C_3H_6-$, R^1 is hydrogen, alkyl of 1 to 20 carbon atoms, phenyl, phenyl which is substituted by methyl, methoxy, ethoxy or chlorine, $-(C_2H_4-NH)_zH$ or $-(C_3H_6-NH)_zH$, R^2 is hydrogen, alkyl of 1 to 6 carbon atoms or cycloalkyl of 6 to 8 carbon atoms, alk is linear or branched saturated alkylene of 2 to 6 carbon atoms, R is hydrogen or alkyl of 1 to 4 carbon atoms, and R and R^2 may be linked to one another, n is a number from 2 to 5, z is an integer from 1 to 3 and the group



may also be a heterocyclic ring selected from the group consisting of morpholinyl, thiomorpholinyl, piperazinyl, N-methylpiperazinyl, N-ethylpiperazinyl, piperidinyl, pyrrolidinyl and



and

(β) a saturated or unsaturated aliphatic sulfonic acid of 8 to 20 carbon atoms, a benzenesulfonic or naphthalenesulfonic acid, substituted by one or two alkyl groups each of 6 to 20 carbon atoms, and in which the benzene or naphthalene nucleus can be substituted by a hydroxyl group, or mixtures thereof, the molar ratio of (α) : (β) being from 1:1 to 1:5, and the said salt or corresponding mixture acting as a stabilizer in the formulation.

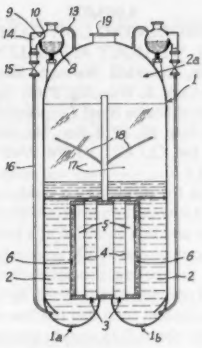
12. A pasty formulation as claimed in claim 1 in which components (a) and (b) are suspended as insoluble particles in an organic fluid medium selected from the group consisting of aromatic hydrocarbons, halohydrocarbons, alcohols, glycols, glycol monoalkyl ethers, polyglycols, diacetone alcohol, benzyl alcohol, phenol, substituted phenols, naphthols, substituted naphthols, ketones, C_1 to C_5 alkyl esters of acetic acid, propionic acid, glycollic acid, lactic acid, carboxylic acid amides and N-methylpyrrolidone and mixtures thereof.

13. A pasty formulation as claimed in claim 12 including a natural, synthetic or semi-synthetic resin dissolved in said organic fluid.

4,069,065
APPARATUS FOR THE CONTINUOUS CRYSTALLIZATION OF SUGAR

Francois Langreney, c/o B.P. 59, 97462 Saint Denis, La Reunion, France

Filed Dec. 16, 1975, Ser. No. 641,256
Claims priority, application France, Mar. 28, 1975, 75 10002
Int. Cl.[2] C13F *1/00;* C13G *1/02*
U.S. Cl. 127—15 5 Claims



1. An apparatus for the continuous crystallization of sugar, formed by a longitudinally horizontal tank with separate, longitudinal, liquid heating and circulation zones in open communication with a common vapor zone, said heating zone containing a heat exchanger having vertically disposed pipes to induce upflow of liquid and other zone thermally isolated from said exchanger and not heated, liquid supply circuits being provided along the tank, a liquid overflow shoot at its exit to withdraw concentrated liquid therefrom and maintain a preset liquid level within said tank, and transverse walls in the vapor zone of the tanks above the heat exchangers, these walls extending below the level of liquid within said tank.

4,069,066
METHOD AND COMPOSITION FOR CLEANING POLISHED SURFACES

Peter Hindle, Sycamore Township, Hamilton County, and William James Welsh, Springdale, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 10, 1976, Ser. No. 739,159
Int. Cl.[2] B08B *3/08;* C11D *3/04, 3/30*
U.S. Cl. 134—6 13 Claims

11. A process for removing soil from hard surfaces which bear a polish cross-linked by metal ions comprising the following steps:

A. applying to said surface from about 0.05 gms. to 3.00 gms. per square foot of a composition comprising:
   a. from about 0.5% to about 20% of an amine-derived nitrogenous surfactant;
   b. amine impurities which are introduced into said composition with said nitrogenous surfactant;
   c. a water-soluble salt of a metal ion capable of complexing said amines in an amount such that the molar ratio of said salt to said amines is from about 1:1 to 1:4; and
   d. water;

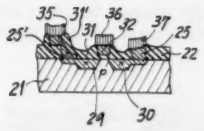
and

B. distributing said composition in an oscillating manner over the entire area of said surface.

4,069,067
METHOD OF MAKING A SEMICONDUCTOR DEVICE

Eisuke Ichinohe, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 16, 1976, Ser. No. 667,445
Claims priority, application Japan, Mar. 20, 1975, 50-34179; Mar. 20, 1975, 50-34156; Mar. 28, 1975, 50-36588; Mar. 28, 1975, 50-36589; May 6, 1975, 50-54839
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 7 Claims



1. A method of making an integrated circuit semiconductor device comprising the successive steps of:

a. providing a semiconductor substrate material of a first conductivity type,
b. forming an insulation film having thinner parts, thicker parts and openings on a principle face of said semiconductor substrate,
c. depositing a low-resistance semiconductor film on both the insulation film and openings,
d. depositing an oxidation-resistant film on said low-resistance semiconductor film,
e. forming a plurality of retained regions of said low-resistance semiconductor film by at least thinning the low-resistance semiconductor regions surrounding said retained regions, said retained regions being at least partly covered by said oxidation resistant film,
f. introducing at least one impurity of a second conductivity type material into selected portions of the substrate region utilizing said retained regions of step (c) as a mask,
g. oxidizing selected parts of the low-resistance semiconductor film by utilizing said oxidation-resistant film as a mask tc form an insulation film,
h. removing said oxidation-resistant film, thereby exposing a surface of said low-resistance semiconductor film, and
i. forming metal contact films of a predetermined pattern on said exposed surface of said low-resistance semiconductor film.

4,069,068
SEMICONDUCTOR FABRICATION METHOD FOR IMPROVED DEVICE YIELD BY MINIMIZING PIPES BETWEEN COMMON CONDUCTIVITY TYPE REGIONS

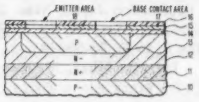
Klaus D. Beyer, Poughkeepsie; Gobinda Das, Beacon; Michael R. Poponiak, Newburgh, and Tsu-Hsing Yeh, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

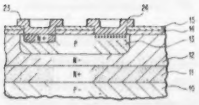
Filed July 2, 1976, Ser. No. 701,789
Int. Cl.[2] H01L *21/265, 29/32*
U.S. Cl. 148—1.5 9 Claims

1. In the method of manufacture of a semiconductor device, a method of forming an emitter region with a substantial reduction in the number of pipes which result in shorts or leakages between two regions of identical conductivity, comprising the steps of;

forming a base region of a semiconductor device, and
introducing nucleation sites for dislocation loops by ion implanting non-dopant ions into said base region of the semiconductor device to be subsequently doped with emitter type impurity, said nucleation sites being formed near the front surface of said base region of said device, and

subsequently introducing emitter type impurity into said region to form the emitter region whereby said nucleation





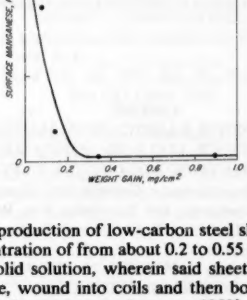
sites are converted into small electrically harmless dislocation loops thereby reducing the number of pipes.

4,069,069

METHOD FOR IMPROVING THE SURFACE QUALITY OF ANNEALED STEEL STRIP

Robert M. Hudson, Churchill Borough; Edward J. Oles, Jr., Pittsburgh, and Clair John Warning, Plum Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1976, Ser. No. 710,997
Int. Cl.[2] C21D *1/74*
U.S. Cl. 148—12.1 **2 Claims**



1. In the production of low-carbon steel sheet, containing a bulk concentration of from about 0.2 to 0.55 percent free manganese in solid solution, wherein said sheet is cold rolled to desired gage, wound into coils and then box annealed, at an annealing soak temperature between 1050° to 1400° F, in an atmosphere which is protective to the iron in said sheet, said atmosphere containing H_2 and N_2 and having an oxidation potential which is preferentially oxidizing to manganese; whereby during said box annealing the manganese concentration in the surfaces of said coils at the edges thereof, is substantially enriched over that of said bulk manganese concentration, thereby resulting in an undesirable appearance known as "annealing border,"

the improvement which comprises, (a) at a temperature not substantially higher than said annealing soak temperature, heating said coils in an atmosphere which is oxidizing to iron so as to provide an iron oxide weight gain within the range 0.08 to 0.8 mg/cm^2 of strip surface and (b) thereafter annealing said coils in said protective atmosphere, said annealing being conducted for a time at least sufficient to reduce said iron oxide,

and wherein the weight gain from said step (a) oxidizing treatment is at least sufficient to reduce the manganese concentration in the surface of said sheet at the edges thereof, to approximately the bulk manganese concentration.

4,069,070

METHOD OF PRODUCING LOW CARBON TIN-MILL GAGE STEEL WITHOUT ANNEALING BORDER

Robert M. Hudson, Churchill Borough; Edward J. Oles, Jr., Pittsburgh, and Clair J. Warning, Plum Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 633,759
Int. Cl.[2] C21D *1/74, 9/46*
U.S. Cl. 148—12.1 **2 Claims**

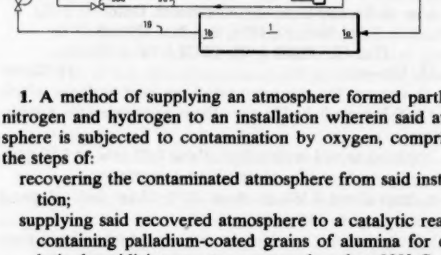
1. In the process for producing a cold rolled tin-mill gage steel coil wherein a low-carbon steel is hot rolled, pickled, cold rolled to final gage and box annealed at a temperature of 1050° to 1400° F in a commercial HNX atmosphere; the improvement comprising preventing the formation of an annealing border on the steel coil during the anneal by providing the steel with a manganese content such that the free manganese in solid solution is less than about 0.23 weight percent.

4,069,071

METHOD FOR GENERATING A REDUCING ATMOSPHERE FOR HEAT-TREATING INSTALLATIONS

Alfred Normand, Paris, France, assignor to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Filed Mar. 18, 1976, Ser. No. 667,983
Claims priority, application France, Apr. 11, 1975, 75 11350
Int. Cl.[2] C21D *1/48*
U.S. Cl. 148—16 **9 Claims**



1. A method of supplying an atmosphere formed partly of nitrogen and hydrogen to an installation wherein said atmosphere is subjected to contamination by oxygen, comprising the steps of:

recovering the contaminated atmosphere from said installation;

supplying said recovered atmosphere to a catalytic reactor containing palladium-coated grains of alumina for catalytic de-oxidizing at a temperature less than 200° C;

cooling the de-oxidized atmosphere to remove condensable substances therefrom;

supplying the cooled de-oxidizing atmosphere to said installation; and

supplying fresh amounts of nitrogen and hydrogen to said installation as a function of the hydrogen content of said atmosphere.

4,069,072
ALUMINUM ALLOY

Roger Develay, Seyssinet Pariset, and Jean Coupry, Courblerie, both of France, assignors to Pechiney Ugine Kuhlmann, Lyon, France

Continuation-in-part of Ser. No. 479,766, June 17, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,413
Claims priority, application France, June 20, 1973, 73 22388
Int. Cl.² C22C *21/10*
U.S. Cl. 148—32 **3 Claims**

1. Wrought aluminum based alloy consisting essentially of:

Zn	6.5 to 10% by weight
Cu	4.5 to 7% by weight
Mg	0.1 to 1% by weight
Mn	0.01 to 0.5% by weight
Ti	0.01 to 0.3% by weight
Fe	up to 1% by weight
Ni and Co	on condition that $\frac{Fe}{Ni + Co} = 1 \pm 0.3\%$ by weight
Si	less than 0.5% by weight
Zr	less than 0.5% by weight
Sn	less than 0.5% by weight
Sb	less than 0.5% by weight
Cd	less than 0.1% by weight
Be	less than 0.1% by weight
Ge	less than 0.75% by weight

Remainder aluminum plus impurities.

4,069,073
PROCESS FOR THE PRODUCTION OF A FERROMAGNETIC METAL POWDER

Eiichi Tadokoro; Masashi Aonuma, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 2, 1975, Ser. No. 619,004
Claims priority, application Japan, Oct. 11, 1974, 49-116169
Int. Cl.² H01F *1/02, 1/06*
U.S. Cl. 148—105 **9 Claims**

1. In a process for the production of a ferromagnetic metal powder containing at least 75% by weight of at least one metal selected from the group consisting of Fe, Co, Ni, Fe—Co, Fe—Ni, Co—Ni and Fe—Co—Ni by reducing a metal salt capable of forming the ferromagnetic metal powder with a reducing agent by a wet or dry process in the presence of a non-magnetic element or an organic compound, thus obtaining an oxidation resistant ferromagnetic metal powder, the improvement which comprises treating further the ferromagnetic metal powder separated from the reducing reaction system with a solution containing phosphate ions with a concentration of 0.00001 to 10 mols/liter at a temperature of from −10° to + 120° C.

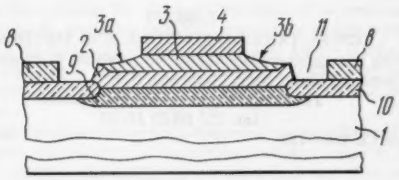
4,069,074
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Styapas Styapono Yanushonis, ulitsa Antakalne, 94, kv. 31; Bronjus-Vitautas Bronyaus Belyauskas, ulitsa Antakalne, 75, kv. 78; Vida-Katrina Jule Sherkuvene, ulitsa G.Gaya, 24, kv. 3, and Vladas Klemovich Banjulis, ulitsa Ateites, 11, kv. 512, all of Vilnjus, U.S.S.R.

Filed Jan. 7, 1976, Ser. No. 647,010
Int. Cl.² H01L *21/225*
U.S. Cl. 148—188 **8 Claims**

1. A method of making semiconductor devices comprising the steps of:

a. providing a semiconductor substrate having a first type of conductivity;
b. forming a doping layer on said substrate, said doping layer having a dopant of a second type of conductivity, said doping layer being etchable at a known rate with a first etchant;
c. forming a shielding layer atop said doping layer, said shielding layer being etchable at a known rate with the first etchant;
d. forming a first masking layer atop said shielding layer, said masking layer being etchable at a rate higher than said shielding layer;
e. forming a photoresist pattern on said first masking layer;
f. forming a technological structure by etching away exposed portions of said masking, shielding and doping layers with the first etchant;
g. forming an additional masking layer over the entire substrate surface;
h. diffusing a first region of a second type of conductivity into said substrate from said doping layer;

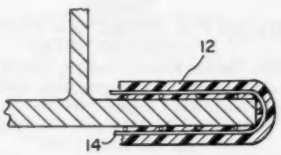


i. forming an insulating layer along the perimeter of said technological structure by thermal treatment under oxidizing conditions;
j. forming a window in said additional masking layer, said window overlapping at least two portions of the perimeter of said technological structure;
k. forming windows by selectively etching said shielding and masking layers to expose the surface of said region of second type of conductivity using as a mask said first masking layer and said additional masking layer;
l. diffusing through at least one of said windows a dopant of the first type of conductivity; and
m. forming a metallization pattern.

4,069,075
STRUCTURAL SUPPORT FOR CHAR DERIVED FROM INTUMESCENT COATINGS

Rudolph W. Billing, Littleton, and George K. Castle, Chelmsford, both of Mass., assignors to Avco Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 478,844, June 13, 1974, Pat. No. 3,913,290. This application Jan. 27, 1975, Ser. No. 544,168
Int. Cl.² B29C *25/00*
U.S. Cl. 156—82 **2 Claims**



1. A method of producing a structural support for the char residue derived from a char-forming intumescent coating on structural members comprising the steps of:

mounting a fire resistant mesh member on the surface of the structural member; and
applying a self-adhering char-forming intumescent coating on the surface of the structural member so as to substantially encapsulate the entire mesh member and thereby anchoring to the surface the char residue formed when the intumescent coating is fully activated and reacted by a fire.

4,069,076

LIQUID LAMINATION PROCESS

Michael Glenn Fickes, Matawan, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 29, 1976, Ser. No. 745,680
Int. Cl.[2] B32B *31/02*
U.S. Cl. 156—83 9 Claims

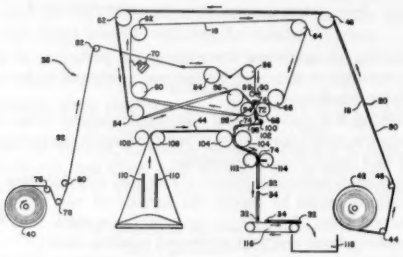
1. In a process for applying a photoresist film to a preimaged, patterned relief substrate wherein the height of the relied image is at least 0.0004 inch and the thickness of the photoresist film is at least one third the thickness of the relief image height, the improvement comprising flooding with a solvent or non-solvent swelling agent the patterned relief substrate to a depth of swelling agent at least to cover the relief height prior to the application of said photoresist film.

4,069,077

TOWEL TABBING MACHINE AND METHOD

Frank Baumgartner, Jamesburg, N.J., assignor to Pacon Manufacturing Corporation, Metuchen, N.J.

Filed Sept. 16, 1976, Ser. No. 723,683
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—152 9 Claims



1. A tabbing machine comprising:

a source of adhesive tape having a release layer and an adhesive layer having adhesive on both sides thereof;

means for separating said adhesive layer from said release layer;

means for inserting a tab between said separated adhesive layers and said release layer;

means for reuniting said adhesive layer and said release layer; and,

means for cutting substantially transversely through said reunited tape and said tab at the location where said tab was inserted.

4,069,078

PROCESS FOR FINISHING A NONWOVEN FILM-FIBRIL SHEET

Milton David Marder; Robert Osmalov, both of Richmond, Va., and Gerald P. Pfeiffer, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 23, 1976, Ser. No. 717,006
Int. Cl.[2] B32B *27/00*
U.S. Cl. 156—181 4 Claims

1. A process for preparing a bonded nonwoven sheet of polyethylene film-fibrils, said sheet having high delamination strength and uniformity of appearance, said process comprising

1. providing a lightly consolidated, non-woven, film-fibril sheet having a basis weight of from about 34–119 g/m^2 (1–3.5 oz/yd^2), a coefficient of variation in basis weight, normalized to a 68 g/m^2 (2 oz/yd^2) basis weight, of from about 8 – 15%, and a density of from about 0.2–0.4 g/cc;

2. passing the lightly consolidated sheet through a nip formed between two rolls while applying a nip loading sufficient to provide an average nip pressure of from about 1.7–6.2 MPa (250–900 psi); one of said rolls having a multiplicity of bosses over practically its entire surface and extending from the surface of the roll to a height of from about 50–100% of the thickness of the lightly consolidated sheet, said bosses having tips which have at least one dimension being less than 0.64 cm (0.25 in) and the most prominent of which, in aggregate, form an area which is from about 1–50% of the area of the surface of the roll; the other roll having a surface with a durometer hardness of from about 55–80 as measured on the Shore D scale;

3. passing the resulting sheet, while under restraint, through a heating zone and raising the temperature of one surface of the sheet sufficiently to cause fusion of surface film-fibrils so as to obtain a sheet having an abrasion resistance of at least two cycles and cooling the sheet, while under restraint to a temperature below that at which the sheet distorts or shrinks; and

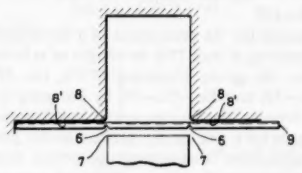
4. repeating step (3) with the opposite side of the sheet to obtain a bonded sheet with an opacity of more than about 72% but less than about the value obtained from the equation, % opacity = $92 - 1.9\sqrt{121 - \text{basis weight}}$, said basis weight being the basis weight of the finished product in g/m^2.

4,069,079

METHOD AND APPARATUS FOR PRODUCING ACCUMULATOR PLATE SEPARATOR POCKETS

Frank Eggert, Hamburg, Germany, assignor to Schlegel GmbH, Hamburg, Germany

Filed Aug. 16, 1976, Ser. No. 714,510
Claims priority, application Germany, Aug. 27, 1975, 2538122
Int. Cl.[2] B29C *17/04*
U.S. Cl. 156—212 6 Claims



1. A method of producing accumulator separator pockets wherein each pocket comprises two spaced rectangular films positioned in register and joined together on three sides by an elongated edge strip of U-shaped cross section comprising the steps of:

guiding and positioning an elongated edge strip of U-shaped cross section across the entrance of a U-shaped work cavity with a center portion of said edge strip in register with said entrance and having a length slightly smaller than the width of said entrance, said edge strip further having end portions bearing against end surfaces of corners defining said entrance, and an opening in said edge strip facing away from said work cavity;

positioning a pair of rectangular films in registering relation with the leading ends thereof in alignment with said center portion of said edge strip and facing said opening in said edge strip;

inserting said leading ends of said films into said opening in said center portion of said edge strip; and

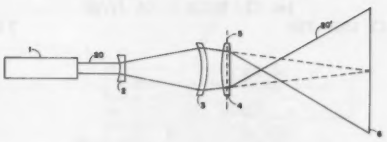
moving said films and said center portion of said edge strip into said work cavity causing said end surfaces of said corners of said entrance to fold said end portions of said edge strip over corresponding sides of said films for producing a pocket.

4,069,080

METHOD AND APPARATUS OF BONDING SUPERPOSED SHEETS OF POLYMERIC MATERIAL IN A LINEAR WELD

Richard Francis Osborne, Mauldin, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed June 11, 1976, Ser. No. 695,277
Int. Cl.[2] B29C *19/02;* B23K *9/00;* G02B *3/06*
U.S. Cl. 156—272 5 Claims



1. A method of welding sheets of polymeric material together with a laser energy source comprising the steps of:

a. pneumatically clamping at least two of said sheets together in the area to be welded with air impinging on opposed sides of said sheets; and,

b. focusing the beam from said laser energy source into a line upon one side of the clamped area thereby bonding said sheets together in a linear weld.

4,069,081

METHOD FOR PROTECTIVE FILM LAMINATION WITH CURL CONTROL

Herbert M. Drower, Wilmette, and Edison L. Rhyner, Chicago, both of Ill., assignors to Sealtran Corporation, Chicago, Ill.

Filed Aug. 4, 1976, Ser. No. 711,491
Int. Cl.[2] B29C *19/02;* B65C *9/25*
U.S. Cl. 156—272 11 Claims

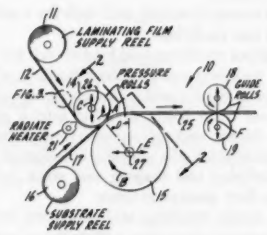


FIG. 3

1. The method of laminating a protective transparent film to a document substrate, without producing appreciable curl in the finished laminate, comprising the following steps:

A. preparing a composite protective film comprising an outer layer of tough, transparent abrasion resistant resin and an inner layer of transparent thermoplastic bonding resin, including the addition of a limited quantity of a radiant-heat-blocking pigment to the bonding resin in an amount sufficient to increase the radiant heat absorption of the bonding resin and to decrease its radiant heat transmission but small enough to preclude material degradation of the transparency of the composite film to visible light;

B. heating the bonding resin layer of the composite film by directing radiant heat to impinge directly upon the bonding resin;

C. laminating the composite protective film to a substrate by passing the composite film and the substrate between first and second pressure rolls, promptly after heating of the adhesive, with the adhesive surface of the film in engagement with an inner surface of the substrate, the outer surface of the film engaging the first pressure roll, and the outer surface of the substrate engaging the second pressure roll; and

D. maintaining the resulting laminate in engagement with the second pressure roll through an appreciable arcuate distance on the second pressure roll after clearing its engagement with the first pressure roll.

4,069,082

PROCESS FOR THE TRANSFORMATION OF A COMMINUTED SWELLABLE CELLULOSE ETHER INTO AN EASILY WORKABLE MATERIAL

Ludwig Grosse, Taunusstein, and Hans-Werner Dorr, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 6, 1976, Ser. No. 747,958
Claims priority, application Germany, Dec. 4, 1975, 2554558
Int. Cl.[2] B05D *1/28, 7/00*
U.S. Cl. 156—281 8 Claims

1. In the process for the transformation of comminuted cellulose ether, which has been rendered at least largely water-insoluble by modification, but which is still highly swellable with water, into an easily workable material, in which process the modified cellulose ether is attached to a hydrophilic support web,

the improvement comprising dispersing the modified cellulose ether in a solution of unmodified cellulose ether in an organic solvent, coating the support on at least one of its surfaces with the dispersion and then drying.

4,069,083

BONDING MATERIAL AND METHOD

David Nelson Palmer, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1975, Ser. No. 643,065
Int. Cl.[2] C09J *5/00*
U.S. Cl. 156—329 8 Claims

1. A method of adhering and acoustically and electrically coupling an acoustic transducer to a surface wherein said coupling will be subject to high temperature and radiation comprising the steps of applying a layer of electrically conductive coupling material between said transducer and said surface and allowing said coupling material to cure by vehicle-solvent release to cause said transducer to be adhered and coupled to said surface, said coupling material comprising:

a. a carborane polysiloxane adhesive;

b. a vehicle-solvent for said carborane polysiloxane adhesive, said vehicle-solvent being evaporatable from said bonding material whereby said bonding material will cure by vehicle-solvent release;

c. a wetting agent; and

d. a conductive agent.

4,069,084

NOVEL DOSAGE FORM

Arthur Roman Mlodozeniec, Montclair, and Lawrence Samuel White, Ramsey, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 640,652, Dec. 15, 1975, Pat. No. 4,029,757.
This application Apr. 4, 1977, Ser. No. 784,011
Int. Cl.[2] B32B *31/06, 31/08*
U.S. Cl. 156—378 4 Claims

1. A system for producing solid, pharmaceutical unit dosage forms comprising in combination:

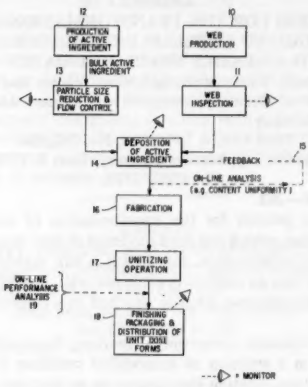
a. first means for producing a web of edible, therapeutically inert material;

b. second means receiving said web for loading to said web at least one medicament;

c. third means receiving said loaded web for fabricating said loaded web into a solid geometric form of predetermined dimensions having said medicament substantially internalized, said form being divisible into a plurality of unit dosage forms, said means including means for forming a continuous stack of a plurality of layers of web by fan-folding a continuous structure comprising at least one pair

of layers of web having medicament loaded to the facing surfaces thereof and means for densifying and shaping said stack into a continuous rod-like geometric form;

d. fourth means receiving said geometric form for unitizing said geometric form into a plurality of unit dosage forms;



e. fifth means receiving said unit dosage forms for sealing said unit dosage forms and completely internalizing said medicament; and

f. means for testing on-line non-destructively the output of at least one of said first through said fifth means and thereby assure uniform quality of said unit dosage forms.

4,069,085

APPARATUS FOR FORMING APERTURES IN A THIN METAL TAPE SUCH AS A SHADOW MASK FOR A COLOR TELEVISION DISPLAY TUBE

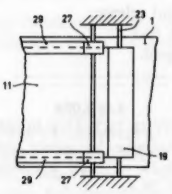
Petrus Johannes Buysman; Gerardus Antonius Wilhelmus Vermeulen, and Cornelis Arie Bos, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 485,845, July 5, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,524

Claims priority, application Netherlands, July 16, 1973, 7309840

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—345 **3 Claims**



1. In an apparatus for etching apertures in a continuously moving thin metal tape, both surfaces of which tape have previously been provided with apertured etch resistant coatings, by bringing said tape into contact with an etching fluid and then removing said etching fluid from said tape, the improvement wherein said apparatus in addition comprises means for moving a section of an endless belt of an etch resistant synthetic resin material having a width at least as large as that of said metal tape in the same direction and at the same rate as said metal tape, means for bringing said section of said belt into substantial contact with a surface of said thin metal tape while both tape and belt are in motion, and means, prior to bringing said metal tape into contact with said etching fluid, for temporarily causing at least the edges of said belt to adhere to said thin metal tape in a manner such that upon bringing said tape into contact with said etching fluid, the etching fluid is prevented from reaching said surface of said tape in contact with said belt while the opposing surface of said tape is being etched.

4,069,086

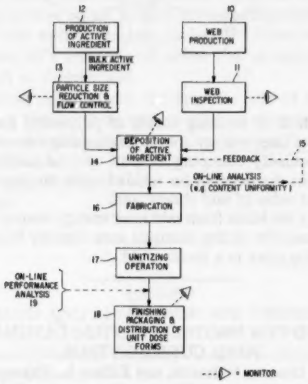
NOVEL DOSAGE FORM

Robert Bruce Reif, Grove City, Ohio, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 640,653, Dec. 15, 1975, Pat. No. 4,031,200. This application Apr. 4, 1977, Ser. No. 784,013

Int. Cl.[2] B32B *31/06, 31/08*

U.S. Cl. 156—378 **7 Claims**



1. A system for producing solid, pharmaceutical unit dosage forms comprising in combination:

a. first means for producing a web of edible, therapeutically inert material;

b. second means receiving said web for loading to said web at least one medicament;

c. third means receiving said loaded web for fabricating said loaded web into a solid geometric form of predetermined dimensions having said medicament substantially internalized, said form being divisible into a plurality of unit dosage forms, said means including means for forming a continuous stack of a plurality of layers of web and means for densifying and shaping said stack into a continuous rod-like first geometric form;

d. fourth means receiving said geometric form for unitizing said geometric form into a plurality of unit dosage forms and sealing said unit dosage forms thereby completely internalizing said medicament; and

e. means for testing on-line non-destructively the output of at least one of said first through said fourth means and thereby assure uniform quality of said unit dosage forms.

4,069,087

APPARATUS FOR WELDING ARTICLES OF THERMOPLASTS

Johannes Lüke; Willy Muth, both of Frankfurt am Main; Wolfgang Riederer, Hofheim, Taunus, and Gunter Wenzel, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 1, 1976, Ser. No. 728,542

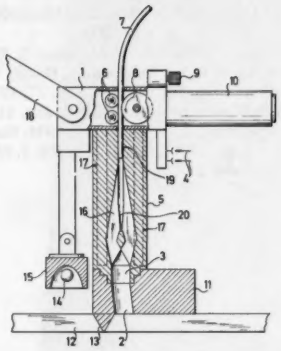
Claims priority, application Germany, Oct. 4, 1975, 2544492

Int. Cl.[2] B32B *31/12, 31/30*

U.S. Cl. 156—391 **5 Claims**

1. In an apparatus for welding thermoplastic articles with additional welding material comprising a welding head including feeding means for feeding a rod of welding material through the head, a melting housing for the welding materials mounted on said welding head and receiving said welding material therefrom, and a welding shoe mounted on the melt-

ing housing and having an outlet opening formed therein for receiving and discharging plasticized welding material from the welding housing, said shoe including a smoothing element, a guide element for guiding the apparatus along a point to be welded, and heating means for heating the joint to be welded, the improvement comprising said melting housing having a guide channel, a melting channel, a melting chamber and a collecting chamber formed therein, said melting channel being located to receive said welding material from said feeding means and for preheating the welding material, said melting



channel communicating at one end with said guide channel and having a diminishing cross-sectional area and being closed at its other end, said melting channel being in communication with said melting chamber to discharge welding material heated in the melting channel into said melting chamber, said melting chamber being located in communication with said collecting chamber which is in communication with said outlet opening of the welding shoe, and heating means in said housing for heating welding material in said melting channel and melting chamber.

4,069,088

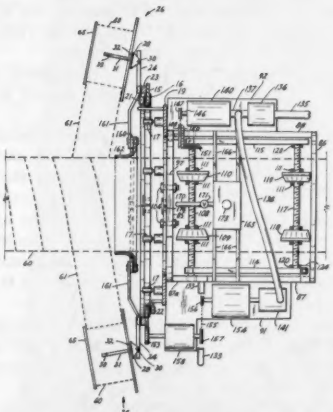
PIPE WRAPPING APPARATUS

Spencer D. Cottam, Harris County, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Nov. 22, 1976, Ser. No. 743,699

Int. Cl.[2] B65H *81/00*; D02G *3/36*; B65H *75/18*

U.S. Cl. 156—392 **47 Claims**



1. Pipe wrapping apparatus, comprising a tape spindle having a tubular spindle shaft, and a support shaft extending into said spindle shaft and pivotally connected to said spindle shaft at the center of the tape roll widths thereof whereby the angular position of said spindle shaft automatically adjusts in response to the tension of the tape as the tape is withdrawn from the tape roll to be wound onto a pipe.

4,069,089

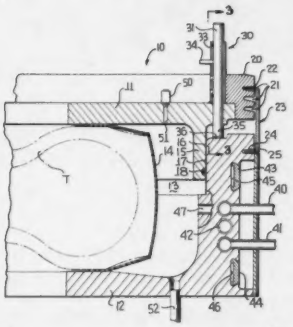
MOLD FOR APPLYING PRE-CURED TREAD RUBBER TO A TIRE, PREFERABLY UTILIZING A RUBBER ENVELOPE

Kenneth T. MacMillan, 4992 Wesleyan Woods Drive, Macon, Ga. 31204

Filed Aug. 13, 1976, Ser. No. 714,280

Int. Cl.[2] B29H *5/04, 17/36*

U.S. Cl. 156—394 **16 Claims**



1. A mold particularly adapted for applying pre-cured tread rubber to tires of different widths comprising a pair of generally annular mold bodies which collectively define a chamber adapted to receive a tire, said annular mold bodies being capable of relative axial movement whereby an axial dimension of said chamber may be selectively adjusted to accommodate tires of different widths, means for locking said annular mold bodies to each other at any one of a plurality of positions of relative axial adjustment between said mold bodies, axially movable axial adjustment means for selectively adjusting the axial dimension of said chamber, said axial adjustment means being carried by one of said annular mold bodies, and said axial adjustment means when selectively adjusted to accommodate a particular tire width has a terminal end face resting upon another of said annular mold bodies.

4,069,090

APPARATUS FOR FORMING AN END CLOSURE IN A TUBULAR KNITTED ARTICLE

Jo Clara Boyer, Los Angeles, Calif., assignor to Saviano, A.G., Balzers, Liechtenstein

Filed Mar. 10, 1976, Ser. No. 665,378

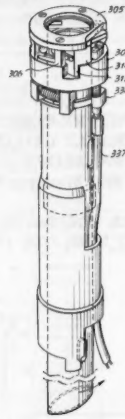
Claims priority, application Germany, Mar. 14, 1975, 2511236; Apr. 24, 1975, 2518298

Int. Cl.[2] D04B *9/00, 39/00*

U.S. Cl. 156—498 **8 Claims**

1. An apparatus for forming an end closure in a tubular knitted article having a synthetic fusible thermoplastic yarn in a portion thereof, comprising means for radially constricting a knitted tube of fabric into a compact substantially solid mass at said portion, said radially constricting means comprising a plurality of sliders sliding in guides formed in an annular member surrounding the knitted tube, each slider having a surface terminating in an arcuate profile shaped to slide along a contiguous slider in the constricting operation until the arcuate pro-

files engage and constrict the tubular portion into said mass, and means for simultaneously heat severing and sealing said



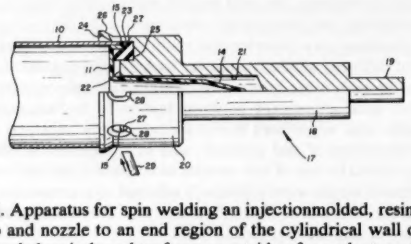
mass to form a small heat set closure core connecting the yarns of the fabric into a closed end.

4,069,091

CARTRIDGE MAKING APPARATUS

Dick T. van Manen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

Division of Ser. No. 589,698, June 23, 1975, Pat. No. 3,982,980, which is a continuation-in-part of Ser. No. 441,971, Feb. 13, 1974, abandoned. This application July 2, 1976, Ser. No. 702,081
Int. Cl.[2] B23K *19/02*
U.S. Cl. 156—498 **2 Claims**



1. Apparatus for spin welding an injectionmolded, resin end cap and nozzle to an end region of the cylindrical wall of an extruded resin barrel to form a cartridge for sealants and the like, said end cap and nozzle having a surface having an interference fit with the inside of said end region of said barrel and said end cap and nozzle having a flange extending radially outward from said interference fit surface by approximately the thickness of said wall of said barrel, said apparatus comprising:

a. a tool rotatable on an axis concentric with the axis of said cylindrical barrel, and means for holding said barrel against rotation;

b. means for holding said end cap and nozzle in said tool and for rotating said end cap and nozzle with said tool;

c. means for providing relative motion axially of said barrel between said barrel and said rotating tool sufficient to insert said interference fit surface of said rotating end cap and nozzle inside said end region of said barrel and to press said flange against the end of said wall of said barrel to spin weld both said interference fit surface and said flange of said end cap and nozzle to said end region of said barrel;

d. said tool having a cylindrical surface rotating with said tool and encircling and rotatably engaging the outside of said end region of said barrel for supporting said end region of said barrel against radial expansion from said interference fit during said spin welding; and

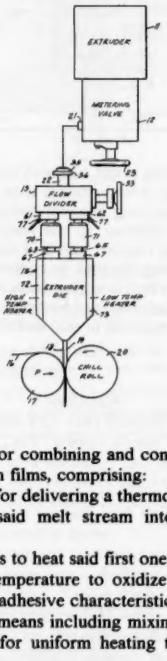
e. said encircling surface of said tool having an aperture positioned for rotating around the seam between said flange and said end wall of said barrel for removing any burrs forming outwardly from said spin weld.

4,069,092

ODOR ELIMINATION APPARATUS FOR EXTRUDED PLASTIC

Stanley C. Zink, Beloit, Wis., and William R. Penrod, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 544,218, Jan. 27, 1975, abandoned, which is a division of Ser. No. 368,958, Jan. 11, 1973, Pat. No. 3,901,636. This application Nov. 22, 1976, Ser. No. 743,804
Int. Cl.[2] B29D *3/02, 3/04, 3/08*
U.S. Cl. 156—500 **8 Claims**



1. An apparatus for combining and controlling the odor of multi-layer extrusion films, comprising:

a single extruder for delivering a thermoplastic melt stream,

means dividing said melt stream into first and second streams,

first heating means to heat said first one of said streams to a high enough temperature to oxidize the resin to attain good flow and adhesive characteristics,

said first heating means including mixing means to mix the resin to allow for uniform heating thereof in said first heating means,

second heating means to at least maintain the second streams at a lower temperature than the first stream, said temperature of said second stream being below the oxidation temperature of the resin,

die means disposed downstream of the first and second heating means having two side-by-side passages therein,,

a third heating means associated with one of said passages and a fourth heating means associated with the other of said passages,

said third heating means maintaining the first melt stream at said high temperature through the die and said fourth heating means maintaining the second melt stream at said lower temperature through the die,

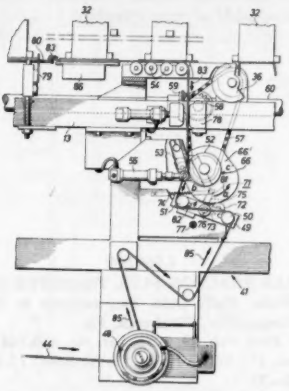
means for extruding the material so heated in the form of a film through the die in side-by-side relation, and

means for combining the two plastic materials with each other and laying the adhesively heated material on a substrate and coating the substrate under pressure.

4,069,093
CARTON SEALING STRIP APPLICATOR

Hans Rolf Ingemar Linner, Helsingborg, Sweden, assignor to AB Akerlund & Rausing, Sweden

Filed Mar. 15, 1977, Ser. No. 777,722
Claims priority, application Sweden, Nov. 12, 1976, 7612636
Int. Cl.[2] B26D 5/00; B31B 1/72
U.S. Cl. 156—522 7 Claims



1. Sealing strip applicator apparatus for use in a packaging machine in which a series of folding boxes are fed one after another in a predetermined direction with substantially constant center-to-center distances and a sealing strip is applied to at least one open end of each folding box, the sealing strip being formed by cutting a length from a continuous ribbon of sealing material, said apparatus comprising:

means for feeding said sealing ribbon;

means for cutting said ribbon at a cutting station;

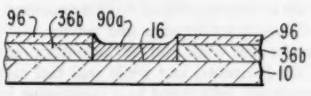
means responsive to the operation of said cutting means for withdrawing the sealing ribbon a predetermined distance so that the leading edge of said ribbon is aligned with the leading edge of the next folding box as seen in the withdrawal direction, said withdrawing means including a pair of rollers adapted to be pressed into engagement with each other, one of said rollers being driven, the ribbon running between said rollers, and means for moving the other of said rollers, said moving means operative for a predetermined time after the operation of said cutting means to move said other of said rollers into pressure engagement with said driven roller with the ribbon engaged therebetween for driving engagement by said driven roller, in a direction opposite to the ribbon feeding direction; and

means for adhering the ribbon over said open end of said next folding box.

4,069,094
METHOD OF MANUFACTURING APERTURED ALUMINUM OXIDE SUBSTRATES

Joseph Michael Shaw, Cranbury, and Karl Heinz Zaininger, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,968
Int. Cl.[2] H01L 21/205
U.S. Cl. 156—612 8 Claims



1. A method for making a planar composite of a monocrystalline silicon island imbedded in aluminum oxide comprising the steps of:

selectively masking a sapphire wafer with a mask of silicon dioxide or a physico-chemical equivalent material,

depositing substantially monocrystalline aluminum oxide on said wafer,

simultaneously depositing polycrystalline aluminum oxide on said mask,

contacting the aluminum oxide deposited on said mask and said wafer with hot phosphoric acid (H_3PO_4), whereby said polycrystalline aluminum oxide is removed by etching but said substantially monocrystalline aluminum oxide remains intact,

removing the mask, whereby the wafer is selectively exposed by an aperture in the aluminum oxide deposited on the wafer,

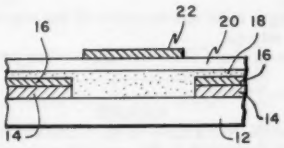
depositing monocrystalline silicon into the aperture and on a non-contiguous surface of the deposited aluminum oxide, and

removing a portion of said deposited silicon which extends above the deposited aluminum oxide whereby a monocrystalline silicon island remains imbedded in the deposited aluminum oxide.

4,069,095
METHOD OF PREPARING PHOTODETECTOR ARRAY ELEMENTS

Robert V. Lorenze, Jr., Westford, and Miriam F. Young, Dorchester, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 7, 1976, Ser. No. 720,917
Int. Cl.[2] B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—632 5 Claims



1. A method of preparing photodetector array elements from a body of photodetector material, comprising:

forming conductive layers on selected portions of a substrate;

coating said conductive layers with a photoresist material;

depositing an adhesive layer on the photoresist and the remaining substrate to a sufficient depth to cover said photoresist;

bonding a body of photodetector material to said adhesive, such that said body is parallel to said substrate;

delineating individual photodetector elements from said body to form elements of an array, thereby exposing the edges of said photoresist material; and

removing the photoresist layer and material deposited thereon.

4,069,096
SILICON ETCHING PROCESS

Alan R. Reinberg, Dallas, and Raman K. Rao, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1975, Ser. No. 628,184
Int. Cl.[2] H01L 21/306
U.S. Cl. 156—643 11 Claims

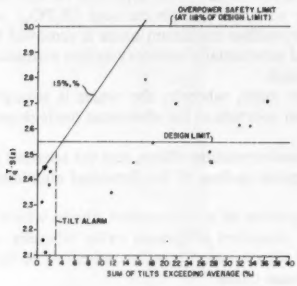
1. A process for etching silicon comprising the step of:

contacting said silicon with a plasma derived from a gas comprising CCl_4, an inert gas, and a gas selected from a group consisting of Cl_2 and HCl.

4,069,097
METHOD AND APPARATUS FOR MONITORING FLUX DEVIATIONS IN A NUCLEAR REACTOR

Fred J. Frank, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 11, 1975, Ser. No. 630,875
Int. Cl.[2] G21C *7/06, 7/00*
U.S. Cl. 176—22 **14 Claims**



1. An improved method for identifying power maldistributions within a given plane of a core of a nuclear reactor comprising the steps of:

measuring a parameter representative of the power within the core at a preset number of locations within the given plane;

supplying an electrical output representative of the power measured at the respective preset locations;

electrically averaging the respective measured powers;

electrically summing the electrical outputs representative of the measured power at the respective locations which deviate in a given direction from the average measured power;

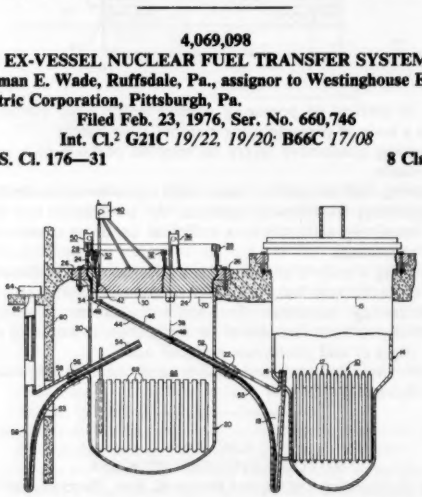
comparing a value representative of the sum to a predetermined setpoint;

supplying an alarm when the sum exceeds the setpoint.

4,069,098
EX-VESSEL NUCLEAR FUEL TRANSFER SYSTEM

Elman E. Wade, Ruffsdale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,746
Int. Cl.[2] G21C *19/22, 19/20;* **B66C** *17/08*
U.S. Cl. 176—31 **8 Claims**



1. A nuclear reactor fuel transfer system comprising:

a fuel transfer area located below the reactor operating coolant level, inclined at an angle to the horizontal and directly connected to the reactor vessel below said reactor operating coolant level for accommodating the transfer of fuel assemblies;

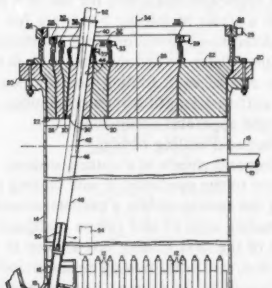
a storage area located below said reactor operating coolant level and directly connected to said fuel transfer area and having an exit port disposed outside said reactor vessel and above said reactor operating coolant level for storing said fuel assemblies; and

an ex-vessel transferring means disposed outside said reactor vessel and cooperating with said storage area and said fuel transfer area for transferring said fuel assemblies between said fuel transfer area and said storage area while said fuel assemblies remain at an angle to the horizontal and while said fuel assemblies remain completely submerged in a continuous body of reactor coolant.

4,069,099
NUCLEAR REACTOR FUEL TRANSFER SYSTEM

Elman E. Wade, Ruffs Dale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,744
Int. Cl.[2] G21C *19/22, 19/20;* **B66C** *17/08*
U.S. Cl. 176—31 **12 Claims**



1. A nuclear reactor fuel transfer system including a reactor vessel having a head thereon, fuel assemblies positioned therein, and an inlet and an outlet for circulating a coolant through said fuel assemblies comprising:

a fuel transfer area located outside said reactor vessel and below the reactor operating coolant level, said fuel transfer area being directly connected to said reactor vessel below said reactor operating coolant level for accommodating the transfer of fuel assemblies;

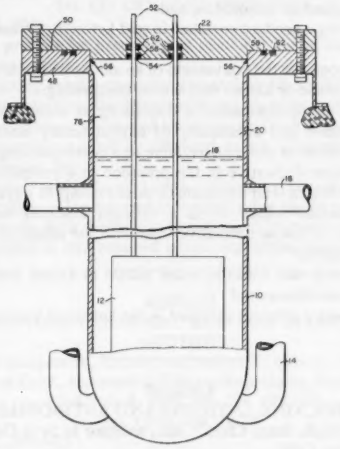
valve means disposed on said head of said reactor vessel and on a wall of said reactor vessel adjacent to said fuel transfer area at an angle relative to the horizontal for selectively isolating said fuel transfer area from said reactor vessel; and

in-vessel transferring means supported by said head of said reactor vessel at an angle to the horizontal corresponding to the inclination of said valve means for transferring said fuel assemblies between said reactor vessel and said fuel transfer area while said fuel assemblies remain at an angle to the horizontal and while said fuel assemblies remain completely submerged in a continuous body of reactor coolant.

4,069,100
ADSORPTION SEAL FOR NUCLEAR REACTORS

Martin H. Cooper, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1975, Ser. No. 549,570
Int. Cl.² G21C *9/00*
U.S. Cl. 176—37 **5 Claims**

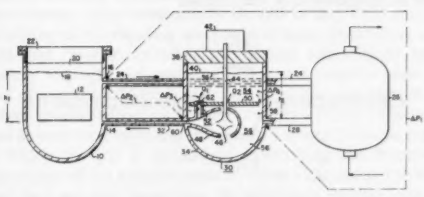


1. A system for reducing the leakage of fission gases from a nuclear reactor comprising:
an enclosure,
means for containment of material within said enclosure,
a first seal installed between said enclosure and said containment means;
a continuous container installed between said enclosure and said containment means outwardly from said first seal, said continuous container having a plurality of openings therein directed inwardly towards said first seal;
a first bypass seal coupled to said continuous container and disposed between said continuous container and said containment means;
a second bypass seal coupled to said continuous container and disposed between said continuous container and said enclosure, said continuous container openings being disposed intermediate said first seal and said bypass seals; and
a fission gas adsorbing material disposed within said continuous container, said fission gas adsorbing material delaying the passage of gases leaking through said first seal and passing through said continuous container openings.

4,069,101
SELF-COMPENSATING LEVEL CONTROL FOR SUMP SUCTION PUMPS

James D. Mangus, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1974, Ser. No. 478,128
Int. Cl.² G21C *19/28*
U.S. Cl. 176—65 **4 Claims**

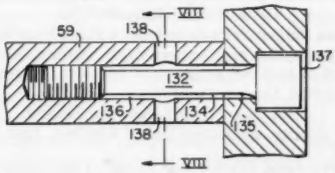


1. A liquid cooled nuclear reactor including a reactor vessel, said reactor vessel being partially filled with reactor coolant and having a cover gas above the level of reactor coolant in said reactor vessel, a heat exchanger connected to an outlet of said reactor vessel, a coolant circulating pump connecting an outlet of said heat exchanger to an inlet of said reactor vessel, said pump being of a type classified as a sump suction pump having an integral sump tank and including inlet and outlet nozzles attached to said sump tank, an impeller disposed within said sump tank, a flow manifold connecting said pump impeller to said pump outlet nozzle, a drive shaft extending within said sump tank and attached to said impeller therein, a divider plate immersed within said reactor coolant within said sump tank, said divider plate being located above said impeller and said pump inlet nozzle so as to divide said sump tank into an upper chamber and a lower chamber, and orifice means for maintaining said cover gas in the tank at a pressure substantially equal to the pressure of said cover gas in the reactor vessel during all speeds of pump operation, said orifice means comprising a flow restricting tube member connecting said manifold to said upper chamber, and said flow restricting tube being sized such that reactor coolant flow through said tube member from said flow manifold to said upper chamber substantially equals reactor coolant flow passed said divider plate from said upper chamber to said lower chamber whereby the reactor coolant level in said pump tank remains substantially constant for all speeds of operation of said pump.

4,069,102
NUCLEAR CORE REGION FASTENER ARRANGEMENT

Robert T. Berringer, Gulf Breeze, and Octavio J. Machado, Pensacola, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1975, Ser. No. 635,024
Int. Cl.² G21C *15/10*
U.S. Cl. 176—87 **7 Claims**



1. An arrangement utilizing flowing reactor coolant fluid to cool a fastener positioned to affix at least two components located between a core and a pressure vessel of a nuclear reactor, said fastener having a head and a shank, at least a portion of the shank of said fastener surrounded by a fastener annulus within at least one of said components, said arrangement comprising a flow channel having an inlet and an outlet, said inlet and outlet being in fluid communication with said annulus and said flowing coolant.

4,069,103
PROCESS FOR RECOVERING DEXTROSE AND DEXTRINS FROM PROTEIN-CONTAINING STARCH PRODUCTS

Hans Müller, im Allmendli, 8703 Erlenbach, Switzerland

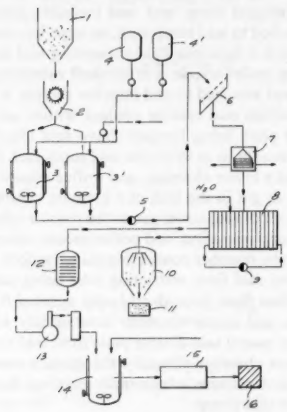
Filed Apr. 20, 1976, Ser. No. 678,710
Claims priority, application Switzerland, Apr. 28, 1975, 5531/75; May 7, 1975, 6086/75; May 27, 1975, 6880/75; May 28, 1975, 6947/75
Int. Cl.² C12D *13/04, 13/06;* **C13K** *1/08;* **C13L** *1/10*
U.S. Cl. 195—4 **12 Claims**

1. A process for obtaining dextrose and dextrins from a protein-containing starch product comprising
subjecting the starch product to an incomplete or complete acid or enzymatic hydrolysis or a combination of both

types of hydrolysis, then circulating the hydrolyzate containing a low viscosity sugar solution and water soluble high molecular proteins through an ultrafilter to separate the proteins from the sugar solution.

and separately recovering the high molecular soluble protein from the filtrate of the ultrafiltration followed by subjecting it to spray-drying to obtain a high protein product useful as human food or animal feed,

while recovering the dextrose or, in case of incomplete hydrolysis, the dextrins from the sugar solution obtained as the filter residue.



4,069,104

CONVERSION OF ALDOSE TO KETOSE IN THE PRESENCE OF OXYANIONS OR MIXED OXYANIONS OF TIN OR GERMANIUM

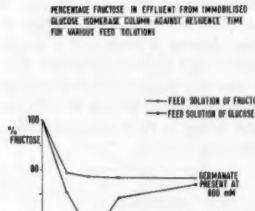
Sidney Alan Barker; Peter John Somers; Robin Ross Woodbury, all of Birmingham, and Geoffrey Harry Stafford, Stockton-on-Tees, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 17, 1976, Ser. No. 696,950

Claims priority, application United Kingdom, June 17, 1975, 25757/75

Int. Cl.[2] C12D *13/02;* **C13K** *11/00, 13/00;* **C07H** *3/02*

U.S. Cl. 195—31 F **18 Claims**


PERCENTAGE FRUCTOSE IN EFFLUENT FROM IMMOBILISED GLUCOSE ISOMERASE COLUMN AGAINST RESIDENCE TIME FOR VARIOUS FEED SOLUTIONS
FEED SOLUTION OF FRUCTOSE
FEED SOLUTION OF GLUCOSE
% FRUCTOSE
100
80
60
40
20
GERMANATE PRESENT AT 800 mM
NO GERMANATE PRESENT
20 40 60 80 100 140 180 220 260 300
RESIDENCE TIME (MINUTES)

1. A process for the conversion of an aldose or aldose derivative to a ketose or ketose derivative, comprising:

forming an aqueous solution containing an aldose or aldose derivative and chemically or enzymatically isomerizing said aldose or aldose derivative to a corresponding ketose or ketose derivative in the presence of a complexing reagent which is an oxyanion or mixed complex oxyanion of germanium or tin which forms a stronger complex with the ketose or ketose derivative than with the aldose or aldose derivative,

maintaining said aqueous solution under aldose to ketose isomerization conditions, and

recovering a product enriched in said ketose or ketose derivative.

2. A process for the conversion of an aldose or aldose derivative to a ketose or ketose derivative, comprising:

forming an aqueous solution containing an aldose or aldose derivative and chemically or enzymatically isomerizing said aldose or aldose derivative to a corresponding ketose or ketose derivative in the presence to a complexing reagent which is an oxyanion or mixed complex oxyanion of germanium which forms a stronger complex with the ketose or ketose derivative than with the aldose or aldose derivative,

maintaining said solution under aldose to ketose isomerization conditions, and

recovering a product enriched in the ketose or ketose derivative.

4,069,105

LIDOCAINE ANTIGENS AND ANTIBODIES

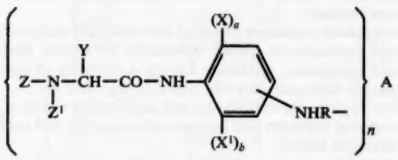
Prithipal Singh, Santa Clara, Calif., assignor to Syva Company, Palo Alto, Calif.

Filed Mar. 3, 1977, Ser. No. 775,658

Int. Cl.[2] C07G *7/00*

U.S. Cl. 195—63 **24 Claims**

1. A composition of the formula



wherein:

X and X^1 are methyl;

a and *b* are 0 or 1, the sum of $a + b$ being at least 1;

Y is hydrogen, methyl, or may be taken together with Z to form a 6 membered ring with the carbon and nitrogen atoms to which Y and Z are respectively attached;

Z and Z^1 are the same or different and are alkyl of from 1 to 4 carbon atoms, with the proviso that Z may be taken together with Y;

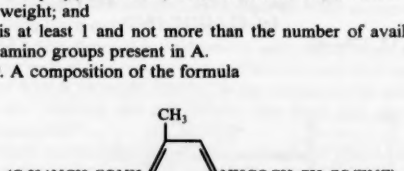
the amino groups bonded to the aromatic ring are separated by from 3 to 4 carbon atoms;

R is a linking group;

A is a poly(amino acid) of at least about 5,000 molecular weight; and

n is at least 1 and not more than the number of available amino groups present in A.

19. A composition of the formula



wherein:

ENZ is an enzyme.

4,069,106

IMMOBILIZATION OF ENZYMES ON KERATIN

William L. Stanley, El Cerrito; Glenn G. Watters, and Bock G. Chan, both of Albany, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 13, 1977, Ser. No. 758,897
Int. Cl.[2] C07G 7/02; G01N 31/14
U.S. Cl. 195—68 1 Claim

1. A process for preparing an insoluble but active enzyme, which comprises —

a. reacting keratin-containing material with a sulfur-containing, reductive, disulphide-splitting agent to reduce keratin and produce a reduced keratin-containing material,

b. dissolving a soluble sulfhydryl group containing enzyme in water, and

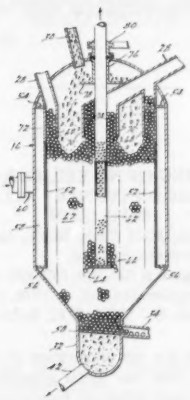
c. mixing said reduced keratin-containing material with the solution of the enzyme in water so that the enzyme reacts directly with the reduced keratin and becomes chemically bonded to said reduced keratin-containing material.

4,069,107

CONTINUOUS THERMAL REACTOR SYSTEM AND METHOD

Edward Koppelman, Encino, and Robert G. Murray, Palo Alto, both of Calif., assignors to Edward Koppelman, Encino, Calif.

Filed May 3, 1976, Ser. No. 682,600
Int. Cl.[2] C10B 49/18
U.S. Cl. 201—12 17 Claims



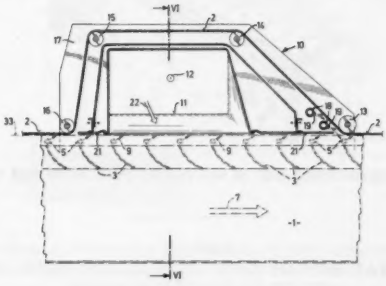
10. A process for pyrolysis of a carbonaceous feed material which comprises the steps of introducing a particulated carbonaceous feed material into the upper portion of an elongated upright reaction chamber, introducing heated pebbles at a controlled temperature into the upper portion of said reaction chamber, mixing a portion of the pebbles in heat transfer contacting relationship with said feed material to form a downwardly moving columnar reaction mass, distributing the remaining portion of the heated pebbles in the form of a downwardly moving upstream layer and a downwardly moving downstream layer substantially devoid of any feed material overlying an surrounding said reaction mass, introducing a gas into said reaction chamber for passage substantially transversely through said upstream layer, said reaction mass and said downstream layer; withdrawing the gas and gaseous pyrolysis products from said chamber along a region adjacent to said downstream layer and transversely spaced from the region at which the gas is introduced, controlling the downward movement of the reaction mass to effect a desired pyrolysis of said feed material, separating the pyrolyzed residue from the pebbles in the lower portion of said reaction chamber, and extracting the pyrolyzed residue from said reaction chamber.

4,069,108

APPARATUS FOR REMOVING DUST-CONTAINING GASES DURING COKING OPERATIONS

Johann Georg Riecker, Ratingen, Germany, assignor to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Mar. 24, 1976, Ser. No. 669,825
Claims priority, application Germany, Mar. 26, 1975, 2513449; July 22, 1975, 2532770
Int. Cl.[2] C10B 27/00, 27/04
U.S. Cl. 202—263 13 Claims



1. In an apparatus for removing hot gases from the vicinity of a coking oven battery comprising a gas-collecting arrangement mounted at the coking oven battery for movement in a path from one coking oven to another; means for conducting the hot gases collected in said gas-collecting arrangement to a location remote from the coking oven battery, including an elongated main duct stationarily mounted at the coking oven battery in substantial parallelism with said path and having an elongated opening extending longitudinally of said main duct and communicating with said gas-collecting arrangement at a portion thereof which is in registry with the latter, and a flexible belt covering the elongated opening, and said gas-collecting arrangement including roller means provided on the inside thereof for lifting the flexible belt to provide open communication between the gas-collecting arrangement and the main duct; the improvement comprising means for protecting said belt from deleterious influences of the hot gases entering said main duct through said portion of said opening and conducted longitudinally of said main duct toward said remote location, including a shielding device accommodated in said main duct extending across the interior of said main duct at least in a region juxtaposed with said portion of said opening to separate the hot gases in the collecting main from said belt.

4,069,109

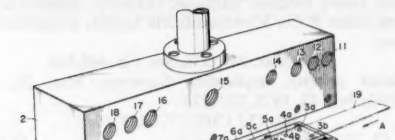
METHOD FOR AUTOMATIC, CONTINUOUS SELECTIVE PLATING ON A TAPE MEMBER

Hiroko Abei, Fujisawashi, Japan

Filed Mar. 31, 1976, Ser. No. 672,512
Int. Cl.[2] C25D 5/02, 5/08, 5/34
U.S. Cl. 204—15 6 Claims

1. A method for automatic, continuous selective plating on a metal strip, comprisng intermittently moving said metal strip in one direction at a predetermined pitch, intermittently engaging at least one or more desired portions of said metal strip with at least one cleaning nozzle, one vacuum nozzle and one plating nozzle which have a shape corresponding to the desired shape of plating layers to be formed and which are arranged linearly

at intervals equal to the pitch of the intermittent movement of said metal strip and cleaning, vacuuming and plating said metal



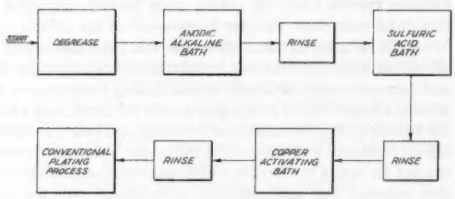
strip intermittently only at said desired portions on said metal strip.

4,069,110

TREATMENT OF BERYLLIUM COPPER SURFACE PRIOR TO ELECTROPLATING

Robert Baboian, Johnston, R.I., and Gardner S. Haynes, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 17, 1976, Ser. No. 658,320
Int. Cl.[2] C25D *7/00, 5/34*
U.S. Cl. 204—29 **10 Claims**



10. A process for electroplating beryllium copper material comprising the steps of:

degreasing the material to remove any organic substances;

passing the material through an anodic alkaline solution to form beryllium compounds of the beryllium in the beryllium copper on the surface and just below the surface of the beryllium copper;

passing the material through a concentrated sulfuric acid bath to dissolve the formed beryllium compounds thereby providing for a copper-rich surface skin;

passing the material through a copper surface activating bath; and

electroplating the material with a suitable plating material.

4,069,111

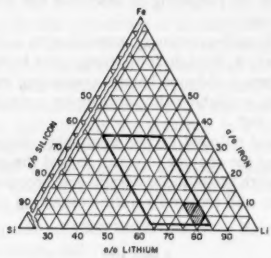
METHOD OF ELECTROCHEMICALLY FORMING A LITHIUM SILICON IRON ALLOY ELECTRODE

San-Cheng Lai, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 715,358, Aug. 18, 1976. This application Feb. 28, 1977, Ser. No. 772,783
Int. Cl.[2] C25D *5/00*
U.S. Cl. 204—39 **3 Claims**

1. A method for electrochemically forming a composite negative lithium electrode structure for an electrical energy storage device from the uncharged state, wherein the formed negative electrode structure comprises a supporting current-collecting matrix in intimate contact with an alloy of lithium, silicon, and iron having the empirical formula Li_xSiFe_y, where x has a value from 1 to 5 and y has a value from 0.125 to 1, which includes the steps of:

providing a supporting current-collecting matrix in intimate contact with an alloy of iron and silicon, the iron being present in an amount from about 11 to 50 atom percent and the silicon being present in an amount from about 89 to 50 atom percent;



immersing the current-collecting matrix containing the iron-silicon alloy in a lithium-containing molten salt electrolyte in a cell in opposing relation to a positive electrode structure, and

electrochemically charging the iron-silicon electrode structure at a selected voltage or current for a time sufficient to form said lithium-silicon-iron alloy negative electrode structure.

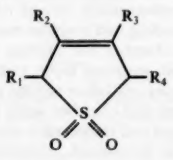
4,069,112

ELECTROPLATING OF NICKEL, COBALT, MUTUAL ALLOYS THEREOF OR TERNARY ALLOYS THEREOF WITH IRON

Edward P. Harbulak, Allen Park, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 697,490, June 18, 1976, abandoned. This application Oct. 4, 1976, Ser. No. 729,074
Int. Cl.[2] C25D *3/12, 3/56*
U.S. Cl. 204—43 T **10 Claims**

6. A composition for the preparation of an electrodeposit which contains; at least one metal selected from the group consisting of nickel and cobalt or; binary or ternary alloys of the metals selected from nickel, iron, and cobalt; which comprises an aqueous acidic electroplating solution containing at least one member selected from nickel compounds and cobalt compounds and iron compounds providing nickel, cobalt and iron ions for electrodepositing nickel, cobalt, nickel-cobalt alloys, nickel-iron alloys, cobalt-iron alloys or nickel-iron-cobalt alloys; the improvement comprising the presence of 5×10^{-6} moles per liter to 0.5 mole per liter of an unsaturated cyclosulfone exhibiting the following generalized structural formula:



wherein

R_1, R_2, R_3 and R_4 are independently hydrogen, lower alkyl, or hydroxyl.

4,069,113
ELECTROPLATING GOLD ALLOYS AND ELECTROLYTES THEREFOR

John Alan Crossley, Oswestry, England; Valerie Kathryn Hacker nee Weimer, Chirk near Wrexham, Wales, and Paul Grahame Clorley, Telford New Town, England, assignors to Oxy Metal Industries Corporation, Warren, Mich.

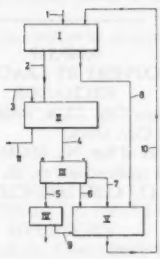
Filed July 19, 1973, Ser. No. 380,804
Claims priority, application United Kingdom, July 26, 1972, 34972/72
Int. Cl.[2] C25D 3/62
U.S. Cl. 204—43 G 14 Claims

1. An aqueous electrolyte solution for use in the electrodeposition of gold which comprises gold in the form of a soluble salt at a concentration of 1 to 32 grams per liter of gold, a base metal selected from the group consisting of cobalt and nickel in the form of a soluble salt at a concentration of 0.1 to 20 grams per liter of base metal, a compatible buffer system effective to produce a pH of 4 to 6 and a density of 1° to 32° Baume, aluminium in the form of a soluble salt at a concentration of 0.01 to 2 grams per liter, and formate or oxalate ions at a concentration of 1 to 250 grams per liter.

4,069,114
METHOD FOR RECOVERING MANGANESE METAL FROM FERROMANGANESE

René Fernand Paul Winand, Rixensart, Belgium, assignor to Universite Libre de Bruxelles, Brussels, Belgium

Filed May 27, 1976, Ser. No. 690,432
Claims priority, application Belgium, May 27, 1975, 829554
Int. Cl.[2] C25C 3/00
U.S. Cl. 204—64 R 8 Claims



1. A method for recovering manganese metal from ferromanganese which comprises:

a. contacting ferromanganese and an iron chloride selected from the group consisting of ferrous chloride and ferric chloride in a molten bath of a metal chloride wherein the metal has a greater chemical affinity for chlorine than iron, to provide a liquid phase containing manganese chloride and a solid phase containing iron precipitate and spent ferromanganese:

b. separating the manganese chloride liquid phase from the iron precipitate and spent ferromanganese;

c. contacting the manganese chloride liquid phase with an additional quantity of ferromanganese to provide a purified liquid phase containing manganese chloride free of iron chlorides and chlorides of metals more noble than manganese;

d. introducing the purified manganese chloride liquid phase into the cathode compartment of an electrolytic cell;

e. introducing the iron precipitate and spent ferromanganese into the anode compartment of the cell;

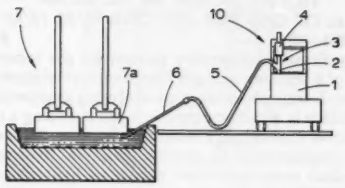
f. conveying electrolyte from the cathode compartment to the anode compartment of the cell while preventing the iron precipitate and spent ferromanganese from passing from the anode compartment to the cathode compartment of the cell;

g. operating the cell to liberate manganese at the cathode and chlorine at the anode, the chlorine reacting with the iron precipitate and spent ferromanganese to produce iron chloride for contact with ferromanganese.

4,069,115
METHOD AND ARRANGEMENT FOR REMOVING A GAS CUSHION

Jørgen Røkholt, Rykkinn, Norway, assignor to Maskin A/S K. Lund & Co., Oslo, Norway

Filed Apr. 27, 1977, Ser. No. 791,498
Int. Cl.[2] C25C 3/06
U.S. Cl. 204—67 8 Claims



1. Method of removing a gas cushion formed at the anode in an electrolytic cell for the production of aluminum by electrolysis of aluminum oxide dissolved in molten cryolite, in which there is employed a tubular lance (6) which through a flexible hose (5) is connected to a source of pressurized gas, and which is with its mouth adapted to be introduced into the gas cushion in order to have this blown away, comprising the step of:

applying the exhaust gas of a combustion engine as the source of pressurized gas into the gas cushion, and wherein the combustion engine is located in a movable machine.

4,069,116
ELECTROCHEMICAL PROCESS FOR PRODUCING MANGANESE DIOXIDE

Levan Nikolaevich Dzhaparidze, ulitsa Saburtalinskaya, 37, kv. 9; Temuri Alexandrovich Chakhunashvili, ulitsa Plekhanova, 2/8; Venera Romanovna Mainsuradze, prospekt Akakiya Tsereteli, korpus 5, kv. 54; Raul Vladimirovich Chagunava, ulitsa Pekinskaya, 2, kv. 23, all of Tbilisi; Zurab Yasonovich Kervalishvili, prospekt Lenina, 14, kv. 3; Nodar Georgievich Sikharulidze, ulitsa Saradzhishvili, 51, kv. 24, both of Rustavi; Dali Georgievna Otiashvili, prospekt V. Pshavela, 11, kv. 12, Tbilisi; Yauzhe Markovich Dubov, Odintsovo, poselok Bakovka, ulitsa Vokzalnaya, 30, Moskovskaya oblast; Eduard Alimovich Bogdanov, tupik Tsulukidze, korpus 2, kv. 10, Tbilisi; Georgy Trofimovich Gogoladze, ulitsa Chavchavadze, 6, kv. 44, Rustavi; Alla Abelevna Teisheva, ulitsa Panfilova, 10, kv. 40, Moscow; Galina Nikolaevna Ryzygraeva, ulitsa Festivalnaya, 65, kv. 706, Moscow; Mikhail Alexeevich Melnikov-Eikhenvald, ulitsa Vavilova, 12, kv. 18, Moscow, and Temuri Valeryanovich Rokva, ulitsa Megrelidze, 16, Tbilisi, all of U.S.S.R.

Filed May 18, 1977, Ser. No. 798,097
Int. Cl.[2] C25B 1/00
U.S. Cl. 204—96 6 Claims

1. An electrochemical process for producing manganese dioxide by electrolyzing a solution containing 100 to 200 g/l of manganese sulphate and 200 to 100 g/l of sulphuric acid, the temperature of the solution being 90° to 98° C, the electrolysis being carried out at an anode current density of 100 to 300 A/m^2 with the use of a titanium anode on whose surface there are provided uniformly spaced hollows whose total surface area is not less than 10 percent of that of the anode, said hollows being provided with a coating consisting of two layers, the first being of a metal of the platinum family, ruthenium dioxide or platinum oxide and having a thickness of 0.8 to 5 mu, or of lead dioxide, in which case it has a thickness of 0.1 to

1 mm, whereas the second layer is of manganese dioxide and has a thickness of 1 to 2 mm, the cathode being of chromium-nickel steel containing 18 to 23 mass percent of chromium, 20 to 28 mass percent of nickel, and alloy additions including copper, molybdenum, titanium, silicon and manganese.

4,069,117
PROCESS FOR REMOVING AND RECOVERING ACIDIC GASES FROM GASEOUS MIXTURES CONTAINING THEM

Hal B. H. Cooper, 4234 Chevy Chase Drive, Pasadena, Calif. 91103

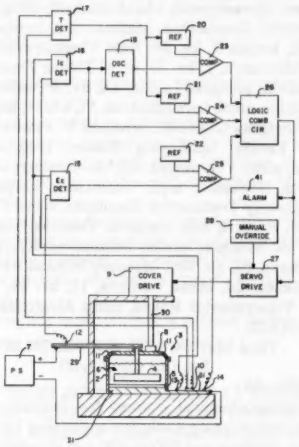
Filed Jan. 28, 1976, Ser. No. 653,400
Int. Cl.[2] C25B *1/20, 1/26;* **C01B** *31/20, 17/60*
U.S. Cl. 204—98 **5 Claims**

1. A cyclic and regenerative process for the removal and recovery of at least one acid gas from a mixture of gases including carbon dioxide comprising: electrolyzing an aqueous alkali metal chloride in a two-compartment cell including a cationic permselective ion-exchange membrane between the anode and cathode compartments to produce chlorine, hydrogen and aqueous alkali metal hydroxide; producing hydrochloric acid from said hydrogen and said chlorine; treating said mixture with said aqueous alkali metal hydroxide to form aqueous alkali metal carbonate/bicarbonate and to form aqueous alkali metal salt from said at least one acid gas; reacting said hydrochloric acid with said aqueous alkali metal salt to form aqueous alkali metal chloride and liberate said acid gas for recovery; and cycling said aqueous alkali metal chloride to said electrolyzing for production of hydrogen, chlorine and aqueous alkali metal hydroxide.

4,069,118
ELECTROLYSIS CONTROL APPARATUS AND METHOD

Elmer L. Hixson, and Carl M. Talkington, both of Austin, Tex., assignors to Stauffer Chemical Company, Richmond, Calif.

Filed Nov. 10, 1975, Ser. No. 630,099
Int. Cl.[2] C25B *1/16, 1/26, 15/06*
U.S. Cl. 204—99 **39 Claims**



1. A method for controlling an electrolysis reaction in an apparatus having a plurality of anode units positioned above at least one cathode where current is conducted between each anode unit and a cathode comprising the steps of,

generating a plurality of current measurement signals, one for each of said anode units, where each of said current measurement signals is proportional to the current in a different one of said anode units,

detecting each of said current measurement signals to detect changes in current with respect to time in any of said anode units which exhibit oscillations having a frequency of less than approximately one cycle per second,

generating an oscillation alarm signal in response to detection of said oscillations,

forming an average current signal as the average value of said current measurement signals,

comparing each of said current measurement signals with a predetermined limit signal to form a current alarm signal whenever one of said current measurement signals exceeds a predetermined deviation from said average current signal.

20. An apparatus providing alarm signals for monitoring an electrolysis reaction comprising,

an electrolysis cell having a plurality of anode units, having a cathode and adapted to have an electrolyte where anode current is conducted from the plurality of anode units through the electrolyte to the cathode,

means for generating a plurality of measurement signals, at least one for each of said anode units, where each of said measurement signals is proportional to an electrical parameter of a different one of said anode units,

detecting means, detecting said measurement signals as current measurement signals, for detecting for each of said anode units changes in anode current with respect to time exhibiting oscillations having a frequency which is less than one cycle per second,

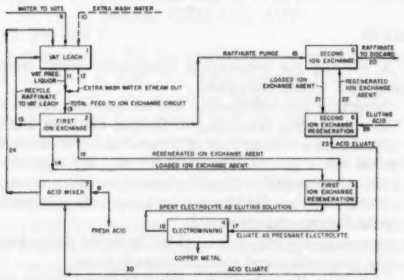
first means for generating an oscillation alarm signal in response to detection of said oscillations by said detecting means, and

second means for generating a limit alarm signal in response to one or more of said measurement signals exceeding a limit signal.

4,069,119
COPPER RECOVERY BY LEACHING AND ION EXCHANGE

Soon Y. Wong, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 686,441, May 14, 1976, Pat. No. 4,039,405. This application Feb. 28, 1977, Ser. No. 773,088
Int. Cl.[2] C25C *1/12;* **C22B** *15/00*
U.S. Cl. 204—106 **10 Claims**



1. A process for the recovery of copper values from copper-bearing ores comprising:

a. leaching the ore with mineral acid in the presence of water to produce a pregnant liquor stream containing dissolved metal values, and washing the leached ore residue with an internal recycle stream from step (c) in addition to other wash waters,

b. passing additional water through the leach vessel containing spent ore residues, said ore being disposed from the system and said water being subsequently combined with the pregnant liquor stream from step (a) to form a resultant stream which is then passed through a

c. first solid ion exchange section containing at least one stage having a solid ion exchange agent for adsorption of

copper values, said ion exchange section producing a loaded solid ion exchange agent and an aqueous raffinate stream containing metal values not extracted from resultant stream of step (b) and separating said raffinate stream into a first internal stream of aqueous raffinate and a second internal stream of aqueous raffinate,

d. passing the first internal raffinate recycle stream back to step (a) leach system, and

e. passing the second internal stream to a second ion exchange section having at least one copper adsorption stage containing a second ion exchange agent where the metal values are adsorbed by the ion exchange agent at a low pH, said solid ion exchange stage producing a loaded solid ion exchange agent and a disposal stream, while;

f. the solid ion exchange agent from step (e) is eluted in at least one elution stage in the presence of sufficient eluting acid containing aqueous eluting agent, resulting in a regenerated ion exchange agent and eluate acid stream;

g. reusing the regenerated ion exchange agent from step (f) in the adsorption stage of step (e) while;

h. the eluate acid stream of step (f), containing recovered copper values is passed to the process described in step (a), while;

i. the loaded ion exchange agent produced in step (c) is subjected to at least one regeneration stage wherein a regenerated ion exchange agent and a pregnant electrolyte stream (eluate) is produced, subsequently;

j. reusing the regenerated ion exchange agent on the resultant stream for copper adsorption of step (c), while;

k. passing the eluate pregnant electrolyte to a metal recovery process from which exits a spent electrolyte which is recycled as eluting solution to step (i) as a stripping agent, while;

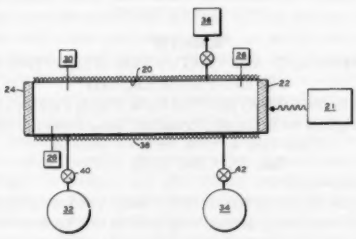
l. recovering the copper values as copper from step (k).

4,069,120

PHOTO-ELECTROLYTIC PRODUCTION OF HYDROGEN

Russell Gilbert Meyerand, Jr., Glastonbury; Nicholas Leo Krascella, Manchester, and David Gue McMahon, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 21, 1976, Ser. No. 725,302
Int. Cl.[2] B01J *1/10*; C25B *1/02*
U.S. Cl. 204—129 **4 Claims**



1. In the production of hydrogen from water, the improvement which comprises:

forming a water/halogen gas mixture;

irradiating the mixture with radiation energy in the visible spectrum to form the corresponding hydrogen halide; and

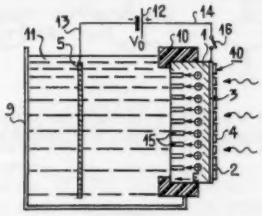
electrolytically decomposing the hydrogen halide to produce hydrogen.

4,069,121

METHOD FOR PRODUCING MICROSCOPIC PASSAGES IN A SEMICONDUCTOR BODY FOR ELECTRON-MULTIPLICATION APPLICATIONS

Christian Baud; Yvan Raverdy, and Henri Hougeot, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 21, 1976, Ser. No. 698,224
Claims priority, application France, June 27, 1975, 75 20393
Int. Cl.[2] C25F *3/12, 3/14*
U.S. Cl. 204—129.3 **5 Claims**



1. A method for drilling microscopic passages between two substantially parallel opposite faces of a semiconductor body, utilizing an electrolysis installation comprising: a cathode and an anode in contact with an electrolyte, and mounted between said cathode and said anode a direct voltage source for bringing said anode to a positive potential Vo with respect to said cathode, said method comprising the steps of: forming a semiconductor body with two substantially parallel opposite faces; providing one of said faces with means for creating at said face hole injector points separated from one another and with connection means causing said hole injector points to be in electrical contact with one another; immersing said semiconductor body in said electrolytic solution in such a manner that its other face, opposite said one face, is in contact with said electrolyte; energizing said connection means to the positive terminal of said source; said source being so dimensioned that the positive potential Vo is greater than that potential required to establish in said semiconductor an electric field extending from said one face at least up to a distance from that face in contact with the electrolyte, lesser than the diffusion length of said microscopic passages in said semiconductor.

4,069,122

MOLECULAR-WEIGHT REDUCTION OF NITROCELLULOSE BY ELECTRON BEAM RADIATION

Charles Vincent Murphy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 1, 1975, Ser. No. 636,408
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 HE **7 Claims**

1. Irradiation process for producing nitrocellulose of reduced molecular weight which comprises subjecting stabilized nitrocellulose in the presence of a damping agent to an absorbed dose of ionizing radiation in the range of about 1.0 to 50 megarads at ambient temperature.

4,069,123

CROSSLINKED PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Martin M. Skoultchi, Somerset, and Irwin J. Davis, Somerville, both of N.J., assignors to National Starch & Chemical Corporation, Bridgewater, N.J.

Filed Oct. 24, 1972, Ser. No. 300,294
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.18 **14 Claims**

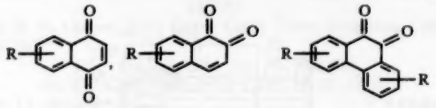
1. A pressure sensitive adhesive composition comprising a blend of:

1. a pressure sensitive adhesive polymer selected from the class consisting of:

i. homopolymers of alkyl esters of acrylic and methacrylic acids and

ii. copolymers of at least one alkyl ester of acrylic and methacrylic acid present in an amount of at least 35% by weight of the copolymer together with at least one other polymerizable comonomer; and

2. from about 0.1–10.0%, as based on the weight of polymer solids, of a quinone compound corresponding to the formulae:



wherein R is selected from the group consisting of hydrogen, halogen, alkyl radicals, aryl radicals and alkoxy radicals.

4,069,124

METHOD FOR CONTROLLED RADIATION POLYMERIZATION OF OLEFINIC MONOMERS

Miroslav Marek; Ludek Toman, and Jan Pecka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 564,603, April 3, 1975, Pat. No. 4,025,403, which is a division of Ser. No. 275,157, July 26, 1972, Pat. No. 3,897,322. This application Nov. 29, 1976, Ser. No. 745,985

Claims priority, application Czechoslovakia, July 29, 1971, 5555/71

Int. Cl.² C08D *1/00*; C08F *1/16*

U.S. Cl. 204—159.24 **6 Claims**

1. A method for the polymerization and and copolymerization of mono-olefinic monomers polymerizable by a cationic mechanism, which comprises subjecting to a source of light selected from a group consisting of ultraviolet light, visible light, and infrared light at a temperature between about 0° C. and about −140° C. a polymerizable mixture selected from the group consisting of (a) isobutylene, and (b) mixtures of isobutylene with at least one diolefinic monomer selected from the group consisting of butadiene and isoprene in the presence of at least one halide catalyst selected from the group consisting of tetravalent vanadium, titanium and zirconium halides and in the presence of an activator for said halide catalyst comprising a mixture of an aluminum alkoxide and an aluminum halide, the molar ratio of said halide catalyst to said activator ranging from 10^3 to 10^{-3} part of halide catalyst to 1 part of activator.

4,069,125

METHOD FOR CONTROLLED RADIATION POLYMERIZATION OF OLEFINIC MONOMORS

Miroslav Marek; Ludek Toman, and Jan Pecka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 564,604, April 3, 1975, Pat. No. 4,025,402, which is a division of Ser. No. 275,157, July 26, 1972, Pat. No. 3,897,322. This application Nov. 29, 1976, Ser. No. 745,772

Claims priority, application Czechoslovakia, July 29, 1971, 5555/71

Int. Cl.² C08D *1/00*; C08F *1/16*

U.S. Cl. 204—159.24 **5 Claims**

1. A method for the polymerization and copolymerization of mono-olefinic monomers polymerizable by a cationic mechanism, which comprises subjecting to a source of light selected from the group consisting of ultraviolet light, visible light, and infrared light at a temperature between about 0° C. and about −140° C. a polymerizable mixture selected from the group consisting of isobutylene and mixtures of isobutylene with at least one diolefinic monomer selected from the group consisting of butadiene and isoprene in the presence of at least one halide catalyst selected from the group consisting of tetravalent vanadium, titanium and zirconium halides and in the presence of at least one activator for acid halide catalyst comprising a reaction produce of BF_3 with a compound selected from the group consisting of (i) an alkoxide, a partially hydrolyzed alkoxide, a halide-hydroxide, and a halide-alkoxide of a metal selected from the group consisting of aluminum and magnesium and (ii) a halide-partially hydrolyzed alkoxide of aluminum, the molar ratio of said halide catalyst to said activator ranging from 10^3 to 10^{-3} part of halide catalyst to 1 part of activator.

4,069,126

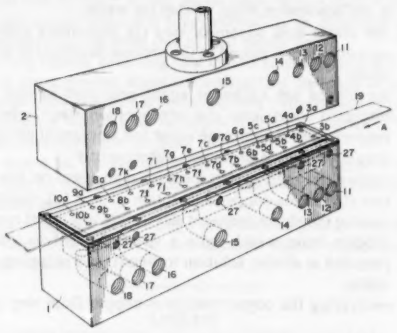
APPARATUS FOR AUTOMATIC, CONTINUOUS SELECTIVE PLATING ON A TAPE MEMBER

Hiroko Abei, Fujisawashi, Japan

Division of Ser. No. 672,512, March 31, 1976. This application Oct. 7, 1976, Ser. No. 730,390

Int. Cl.² C25D *17/00, 19/00*

U.S. Cl. 204—224 R **9 Claims**



1. An apparatus for automatic, continuous selective plating on desired portions of a metal strip, which comprises a plating section including at least one cleaning nozzle, one vacuum nozzle and one plating nozzle, each of said nozzles being mounted in said plating section, which have a shape corresponding to the desired plating layers to be formed and which are arranged linearly, a feeding mechanism for feeding said metal strip on said nozzles intermittently in one direction at a pitch equal to the intervals at which said nozzles are arranged so as to locate said desired portions adjacent said nozzles, a pressing mechanism for pressing only said desired portions of said metal strip onto said nozzles while the metal strip is stopped moving, and means for selectively supplying cleaning liquid to said cleaning nozzle, vacuum to said vacuum nozzle and plating liquid to said plating nozzle.

4,069,127

METHOD AND APPARATUS FOR RECOVERY OF METAL FROM LIQUID

Jerry S. Salemi, Kildeer, and Paul Dean Pease, Palatine, both of Ill., assignors to Ecological Systems, Inc., Palatine, Ill.

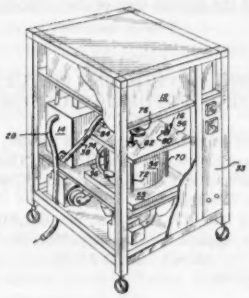
Filed Feb. 4, 1976, Ser. No. 655,004

Int. Cl.² C25C *1/20, 7/00*

U.S. Cl. 204—229 **2 Claims**

1. A metal recovery apparatus for recovering a metal carried in a liquid comprising: a receiving tank having an overflow line connected to an upper portion thereof, said receiving tank having a receiving tank feed line connected to a lower portion thereof; a tank connected to said overflow line and said receiving tank feed line, said overflow line being adapted to receive overflow of said liquid from said receiving tank and channel said overflow of said liquid to said second mentioned tank, said receiving tank feed line being adapted to channel said liquid from said receiving tank to said second mentioned tank; a closed recovery tank connected to said second mentioned tank;

an anode supported in said closed recovery tank; a cathode supported in said closed recovery tank; a timer connected to said anode and said cathode, said timer controlling a time during which a current is applied to said anode and said cathode to collect said metal on said cathode; and a pump connected between said second mentioned tank and said closed recovery tank, said pump being adapted to circulate all of said liquid carrying said metal between said second mentioned tank and said closed recovery tank.



4,069,128

ELECTROLYTIC SYSTEM COMPRISING MEMBRANE MEMBER BETWEEN ELECTRODES

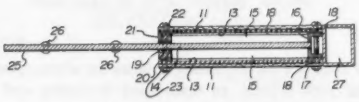
G. Oscar Westerlund, Vancouver, Canada, assignor to Gow Enterprises Limited, Vancouver, Canada

Filed June 8, 1976, Ser. No. 693,752

Claims priority, application Canada, May 3, 1976, 251641

Int. Cl.[2] C25B *1/16, 1/26, 9/00*

U.S. Cl. 204—258 **37 Claims**



29. An electrolyzer cell box comprising:

A. a plurality of rows of banks of interleaved anode units and cathodes, with each bank comprising alternating anode units and cathodes, each said anode unit/cathode comprising a generally rectangular parallelepiped framework including a pair of spaced-apart grid-like structurally rigid peripheral outer side walls; an ionically conductive gas impermeable membrane secured against the inner face of each said outer peripheral walls; an anode disposed between said membranes to provide a pair of anode compartments, said anode extending beyond the anode unit to provide a cathode, the cathode being provided with spacing electrically non-conductive buttons thereon; means for feeding anolyte to said anode compartments including a channel member along one edge thereof and a lower trough for feeding and distributing anolyte to the anode compartments; a header for receiving spent anolyte and entrained and/or occluded gaseous products of electrolysis and enabling the withdrawal thereof from the unit and for withdrawing spent anolyte and entrained and/or occluded gaseous products of electrolysis therein from said anode unit; and means associated with the inlet channel for separating and withdrawing entrained and/or occluded gaseous products of electrolysis from the anolyte before the anolyte is fed to the anode compartments;

B. an anode connecting means connected to the last anode of each row of anode units;

C. a cathode connecting means connected to the first cathode of each row of cathodes;

D. anolyte inlet means to the last anode unit of each row of anode units;

E. means for connecting the downstream anode unit to the immediately adjacent upstream anode unit in each row of anode units for cascading anolyte upstream and removing gaseous products of electrolysis;

F. spent anolyte outlet means from the first unit of each row of anode units;

G. catholyte inlet means to the cathode chambers;

H. spent catholyte outlet means; and

I. catholyte gas outlet means.

4,069,129

ELECTROLYTIC CELL

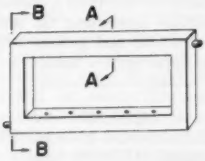
Kimihiko Sato; Yasuo Sajima; Toshihiko Kuno, all of Yokohama, and Harumi Ohbe, Tokyo, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Apr. 15, 1976, Ser. No. 677,257

Claims priority, application Japan, Apr. 15, 1975, 50-44776

Int. Cl.[2] C25B *1/16, 1/26, 9/00*

U.S. Cl. 204—258 **1 Claim**



1. A filter press type electrolytic cell comprising:

a frame for a first catholyte compartment comprising:

a first lower hollow member,

a first upper hollow member,

the first lower and upper hollow members having the same cross sectional shape,

a first left cathode and a first right cathode joining together the first lower hollow member and the first upper hollow member to form a first catholyte compartment therebetween,

the first lower hollow member having apertures in its surface disposed between the first left and the first right cathodes,

the first upper hollow member having apertures in its surface disposed between the first left and the first right cathodes,

a frame for a second anolyte compartment comprising:

a second lower hollow member,

a second upper hollow member,

the second lower and upper hollow members having the same cross sectional shape,

a second left anode and a second right anode joining together the second lower hollow member and the second upper hollow member to form a second anolyte compartment therebetween,

the second lower hollow member having apertures in its surface disposed between the second left and the second right anodes,

the second upper hollow member having apertures in its surface disposed between the second left and the second right anodes,

a frame for a third catholyte compartment comprising:

a third lower hollow member,

a third upper hollow member,

the third lower and upper hollow members having the same cross sectional shape,

a third left cathode and a third right cathode joining together the third lower hollow member and the third

upper hollow member to form a third catholyte compartment therebetween,

the third lower hollow member having apertures in its surface disposed between the third left and the third right cathodes,

the third upper hollow member having apertures in its surface disposed between the third left and the third right cathodes,

the first lower and upper hollow members, the second lower and upper hollow members and the third lower and upper hollow members having the same cross sectional shape,

the second lower hollow member being aligned with and disposed between the first lower hollow member and the third lower hollow member,

the second upper hollow member being aligned with and disposed between the first upper hollow member and the third upper hollow member,

a first diaphragm disposed between the first right cathode and the second left anode but contacting neither the first right cathode nor the second left anode,

the first diaphragm contacting the second lower and upper hollow members and gaskets which contact the first lower and upper hollow members,

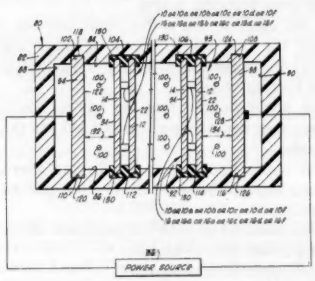
a second diaphragm disposed between the second right anode and the third left cathode but contacting neither the second right anode nor the third left cathode,

the second diaphragm contacting the second lower and upper hollow members and gaskets which contact the third lower and upper hollow members.

4,069,130
BIPOLAR ELECTRODE AND METHOD FOR CONSTRUCTING SAME

Olen L. Riggs, Jr., Bethany, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jan. 29, 1975, Ser. No. 545,015
Int. Cl.² C25B *11/02, 11/10*
U.S. Cl. 204—268 **30 Claims**



30. An improved electrolytic cell having electrodes connected to an electrical power source and at least partially immersed in an electrolyte wherein the electrolytic cell includes at least one bipolar electrode including an anodic member having a first face and a second face and a cathodic member having a first face and a second face, the improvement comprising:

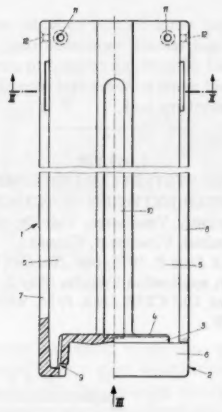
a fastener assembly disposed between the second face of the anodic member and the second face of the cathodic member of each bipolar electrode in the electrolytic cell, each fastener assembly having a portion connected to the second face of the anodic member and the second face of the cathodic member of one of the bipolar electrodes, and each fastener assembly mechanically connecting the anodic member and the cathodic member and spacing the second face of the anodic member a distance from the second face of the cathodic member in one of the bipolar electrodes in the electrolytic cell, a portion of the fastener assembly being constructed of an electrically conductive material establishing electrical continuity between the anodic member and the cathodic member in a fastened position of the fastener assembly; and

means for substantially sealing electrolyte from a substantial portion of the space between the second face of the anodic member and the second face of the cathodic member.

4,069,131
MOUNTING AND HOLDING FIXTURE FOR ELECTROPLATING UNIFORM THICKNESS METALLIC DEPOSITS

Heinz Beck, Wiesbaden-Dotzheim; Klaus Muller, Naurod, Taunus, and Gerhard Erdelen, Wiesbaden, all of Germany, assignors to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden-Schierstein, Germany

Filed Nov. 17, 1975, Ser. No. 632,810
Claims priority, application Germany, Nov. 18, 1974, 2454625
Int. Cl.² C25D *17/06*
U.S. Cl. 204—297 W **4 Claims**



1. In a device for mounting articles for electroplating in a galvanic bath system, an open-sided mounting and holding fixture body consisting of an integral one-piece member of molded synthetic plastic foamed material that is inert with respect to the electrolyte, said body having a back wall, a pair of side walls projecting from said back wall and a bottom wall extending across the lower ends of said back and side walls, said back wall being formed with a centrally located elongated slot for electrolyte flow, an integral platform projecting forwardly from said back wall and defining an upwardly facing article support surface in said body above the bottom wall and adjacent the lower end of said slot, and means defining electrolyte flow openings through said platform and bottom wall.

4,069,132
OIL SHALE RETORTING PROCESS WITH DESULFURIZATION OF FLUE GAS

Roland F. Deering, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 631,055, Nov. 12, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,384
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R **23 Claims**

7. In a continuous process for retorting oil shale wherein a stream of raw, crushed oil shale is countercurrently contacted in a retorting zone with a stream of a hot, essentially oxygen-free education gas, thereby educing from said oil shale a gaseous mixture from which a liquid shale oil product and a product fuel gas are subsequently separated, and producing from said retorting zone a hot, retorted shale containing alkaline

mineral components, coke, and sulfur components, the combination of improvements comprising:

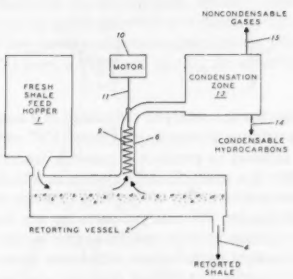
1. introducing at least a portion of about retorted shale into combustor means wherein said retorted shale is passed in succession through a combustion zone and a cooling zone, said combustion zone being maintained at a temperature between about 900° and 1670° F;
2. passing an oxidation gas comprising oxygen concurrently with said retorted shale passing through said combustion zone, said gas being supplied in sufficient quantity and under conditions correlated with the feed rate of said retorted shale and the temperature maintained in said combustion zone so as to:
   a. continuously combust essentially all of said coke in said retorted shale passing through said combustion zone; and
   b. continuously react essentially all gaseous sulfur components produced during the combustion of step (2) (a) with sufficient of said alkaline mineral components to form stable inorganic salts;
3. maintaining said eduction gas and all gases within said combustion zone separately from each other;
4. discharging from said combustion zone an oxygen containing flue gas essentially free of sulfur compounds; and
5. passing a cooling gas countercurrently with the decarbonized shale passing through said cooling zone, thereby cooling said decarbonized shale and heating said cooling gas.

4,069,133

APPARATUS AND PROCESS FOR REDUCING PARTICULATES IN A VAPOROUS STREAM CONTAINING CONDENSABLE HYDROCARBONS

Jack W. Unverferth, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 25, 1976, Ser. No. 700,260
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R **7 Claims**



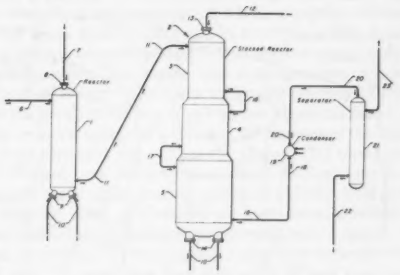
1. In a continuous process for extracting condensable hydrocarbons from hydrocarbon-containing solids including heating said solids in a vessel to form gaseous condensable hydrocarbons and withdrawing from said vessel a gaseous stream including said gaseous condensable hydrocarbons and entrained solid particulate matter, the improvement comprising: removing particulate matter from said stream by passing said stream through a longitudinally curved conduit communicating with said vessel, said curved conduit having rotatably positioned therein a flexible hollow-core elongated spiral element, whereby a portion of said gaseous condensable hydrocarbons are condensed and a semi-solid mass including the resulting condensed hydrocarbons and particulate matter is coalesced, in said conduit, and conveying at least a portion of said mass into said vessel by rotating said element.

4,069,134

HYDROGEN-PRODUCING HYDROCARBON CONVERSION WITH GRAVITY-FLOWING CATALYST PARTICLES

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 26, 1976, Ser. No. 735,706
Int. Cl.[2] C10G *35/04*
U.S. Cl. 208—64 **8 Claims**



1. A multiple-stage process for catalytically reforming a hydrocarbon charge stock which comprises the steps of:
   a. at least periodically introducing a first quantity of fresh, or regenerated catalyst particles into the upper end of a first moving bed reaction zone, through which catalyst particles are movable via gravity-flow, at least periodically withdrawing deactivated catalyst particles from the lower end of said first moving bed reaction zone and removing the same from said process, reacting said charge stock, in the absence of added hydrogen, in said first zone at catalytic reforming conditions;
   b. at least periodically introducing a second quantity of fresh, or regenerated catalyst particles into the upper end of a stacked moving bed reactor system containing a plurality of moving bed reaction zones having a common vertical axis and through which catalyst particles are movable via gravity-flow, at least periodically withdrawing deactivated catalyst particles from the lower end of said moving bed system and introducing the reaction product effluent from said first moving bed reaction zone into the uppermost reaction zone in said stacked moving bed reactor system, and at catalytic reforming conditions;
   c. further reacting the resulting uppermost reaction product effluent, at catalytic reforming conditions, in a lower moving bed reaction zone in said stacked moving bed reactor system; and,
   d. recovering a normally liquid, catalytically-reformed product from the effluent withdrawn from the lowest reaction zone in said stacked moving bed reactor system.

4,069,135

HYDROGEN-PRODUCING HYDROCARBON CONVERSION WITH GRAVITY-FLOWING CATALYST PARTICLES

Chester J. Giuliani, Schaumburg, Ill., assignor to UOP Inc., Des Plaines, Ill.

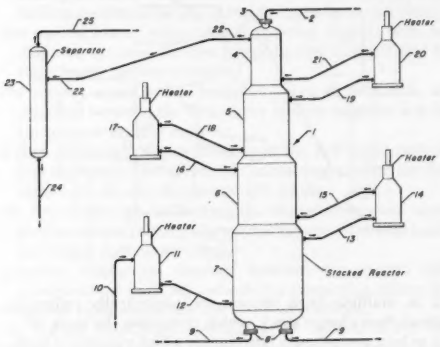
Filed Oct. 26, 1976, Ser. No. 735,705
Int. Cl.[2] C10G *35/12, 39/00*
U.S. Cl. 208—65 **10 Claims**

1. A process for the catalytic reforming of a naphtha charge stock with a catalyst comprising a Group VIII noble metal or an alumina carrier to produce a gasoline fraction of higher octane number in a multiple-stage system in which (1) catalyst particles flow downwardly, via gravity, through each reaction zone in said system, (2) catalyst particles from one reaction zone are introduced into the next succeeding reaction zone, (3) deactivated catalyst particles are withdrawn from said system through the lower end of the last reaction zone and, (4) fresh, or regenerated catalyst particles are introduced into the upper

end of the first reaction zone, which process comprises the sequential steps of:

a. reacting said charge stock, in the absence of added or recycled hydrogen, in said last reaction zone, from which deactivated catalyst particles are withdrawn from said system, at catalytic reforming conditions;

b. further reacting the effluent from said last reaction zone in at least one intermediate reaction zone, at catalytic reforming conditions;



c. further reacting the effluent from said intermediate reaction zone in said first reaction zone, through which fresh or regenerated catalyst particles are introduced into said system, at catalytic reforming conditions; and,

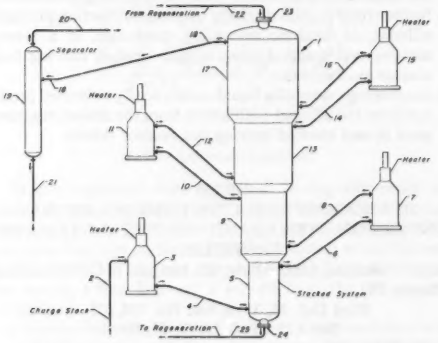
d. recovering a normally liquid, catalytically-reformed product from the effluent withdrawn from said first reaction zone.

4,069,136

COUNTERCURRENT HYDROCARBON CONVERSION WITH GRAVITY-FLOWING CATALYST PARTICLES

Roger L. Peer, La Grange, and Irvin S. Fisch, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 26, 1976, Ser. No. 735,707
Int. Cl.[2] C10G *35/12, 39/00*
U.S. Cl. 208—65 **10 Claims**



1. A process for the catalytic reforming of a naphtha charge stock with a catalyst comprising a Group VIII noble metal on an alumina carrier to produce a gasoline of higher octane number in a multiple-stage reactor system in which (1) catalyst particles flow downwardly, via gravity, through each reaction zone in said system, (2) catalyst particles from one reaction zone are introduced into the next succeeding reaction zone, (3) deactivated catalyst particles are withdrawn from said system through the lower end of the last reaction zone and, (4) fresh, or regenerated catalyst particles are introduced into the upper end of the first reaction zone in said system, which process comprises the sequential steps of:

a. reacting said charge stock, in the absence of added or recycled hydrogen, in said last reaction zone, from which deactivated catalyst particles are withdrawn from said system, at catalytic reforming conditions;

b. further reacting the effluent from said last reaction zone in at least one intermediate reaction zone, at catalytic reforming conditions;

c. further reacting the effluent from said intermediate reaction zone in said first reaction zone, through which fresh, or regenerated catalyst particles are introduced into said system, at catalytic reforming conditions; and,

d. recovering a normally liquid, catalytically-reformed product from the effluent withdrawn from said first reaction zone;

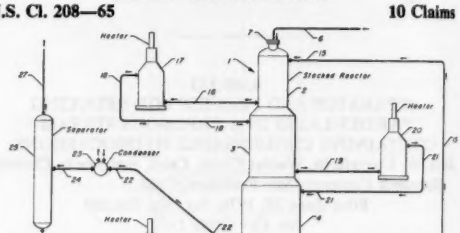
said process being further characterized in that said first reaction zone contains the greater amount of catalyst particles and said last reaction zone contains the least amount of catalyst particles.

4,069,137

HYDROGEN-PRODUCING HYDROCARBON CONVERSION WITH GRAVITY-FLOWING CATALYST PARTICLES

Arthur R. Greenwood, Niles, Ill.

Filed Oct. 26, 1976, Ser. No. 735,708
Int. Cl.[2] C10G *35/12, 39/00*
U.S. Cl. 208—65 **10 Claims**



1. A process for the catalytic reforming of a naphtha charge stock with a catalyst comprising a Group VIII noble metal on an alumina support to produce a gasoline fraction of higher octane number in a multiple-stage system in which (1) catalyst particles flow downwardly, via gravity, through each reaction zone in said system, (2) catalyst particles are transferred in series from reaction zone to reaction zone in said system, (3) deactivated catalyst particles are withdrawn from said system through the lower end of the last reaction zone, and, (4) fresh, or regenerated catalyst particles are introduced into the upper end of the first reaction zone, which comprises the sequential steps of:

a. reacting said charge stock, in the absence of added or recycled hydrogen, in said last reaction zone, from which deactivated catalyst particles are withdrawn from said system, at catalytic reforming conditions;

b. further reacting the effluent from said last reaction zone in said first reaction zone, through which fresh or regenerated catalyst particles are introduced into said system, at catalytic reforming conditions;

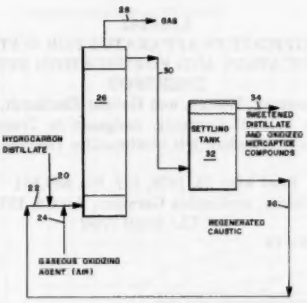
c. further reacting the effluent from said first reaction zone in at least one intermediate reaction zone, at catalytic reforming conditions; and,

d. recovering a normally liquid, catalytically-reformed product from the effluent withdrawn from said intermediate zone.

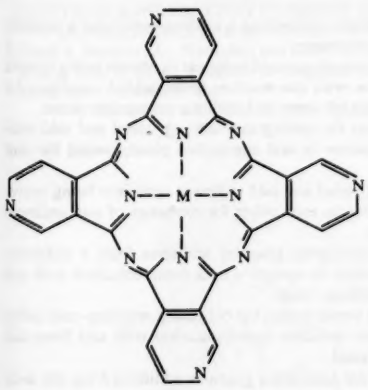
4,069,138
METHOD AND CATALYST FOR REMOVING MERCAPTANS AND MERCAPTIDE COMPOUNDS FROM AQUEOUS ALKALINE SOLUTIONS AND HYDROCARBON DISTILLATES

Clifford Ward, Louisa, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sept. 30, 1976, Ser. No. 728,041
Int. Cl.[2] C10G *27/06, 19/02;* C07C *149/00*
U.S. Cl. 208—206 10 Claims



1. A method for oxidizing mercaptans occurring in petroleum hydrocarbon distillates and alkali mercaptide compounds occurring in aqueous alkaline solutions, said compounds resulting from contacting aqueous alkaline solution with said distillates containing mercaptans to their corresponding disulfide compounds comprising contacting said mercaptans and mercaptide compounds in an aqueous alkaline solution with a gaseous oxidizing agent and with a catalyst comprising a metal complex of 3,4-tetrapyridinotetraazaporphine supported on a solid granular inert carrier and having the structural formula:



where M is a metal selected from the group consisting of iron, manganese, chromium, magnesium, copper, nickel, zinc, titanium, hafnium, thorium, tin, lead, columbium, tantalum, antimony, bismuth molybdenum, palladium, platinum, silver, mercury, vanadium and cobalt.

4,069,139
HYDRODESULFURIZATION OF OIL UTILIZING A NARROW PORE SIZE DISTRIBUTION CATALYST

Kenneth L. Riley, Baton Rouge, and Lloyd A. Pine, Greenwell Springs, both of La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 29, 1975, Ser. No. 644,835
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—216 12 Claims

1. In a process for hydrodesulfurizing a sulfur and asphaltene-containing hydrocarbon oil which comprises contacting said oil under hydrodesulfurization conditions with hydrogen and a catalyst comprising an alumina support composited with a hydrogenation component, said hydrogenation component comprising at least one Group VIB metal component selected from the group consisting of at least one elemental metal, metal oxide or metal sulfide of a Group VIB element of the Periodic Table of Elements and at least one Group VIII metal component selected from the group consisting of at least one elemental metal, metal oxide or metal sulfide of a Group VIII metal of the Periodic Table of Elements, the improvement which comprises said catalyst having a median pore radius ranging from about 70 to about 95 Angstroms, a total pore volume between 0.45 and 1.50 ml/g; less than 0.05 ml/g of said pore volume being in pores with radii greater than 100 Angstroms; at least 0.40 ml/g of said pore volume being in pores with radii in the range between said median pore radius to about 10 Angstroms above and 10 Angstroms below said median pore radius; at least 75 percent of said pore volume being in pores with radii in the range between said median pore radius to about 10 Angstroms above and 10 Angstroms below said median pore radius; less than 0.05 ml/g of said pore volume being in pores with radii below 60 Angstroms, and a total surface area ranging between 130 and 500 square meters per gram.

4,069,140
REMOVING CONTAMINANT FROM HYDROCARBONACEOUS FLUID

Donald K. Wunderlich, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 548,525, Feb. 10, 1975, abandoned. This application May 19, 1975, Ser. No. 578,648
Int. Cl.[2] C10G *29/04*
U.S. Cl. 208—251 H 12 Claims

1. A method for removing a contaminant of at least one of arsenic and selenium from a synthetic hydrocarbonaceous fluid comprising:

a. providing a plurality of particles of a contaminant-removing material that is capable of removing said contaminant from said hydrocarbonaceous fluid and effecting deposition of said contaminant within said particles of said contaminant-removing material, said contaminant-removing material including a solid, high surface area carrier material having a pore volume of at least 0.8 cubic centimeters per gram (cc/gm) with a major portion of the pore volume having a mean effective pore radius greater than 100 A and feeder pores having radii greater than 1,000 A running therethrough for allowing said hydrocarbonaceous fluid to flow thereinto, said particles carrying an active material at least adjacent said pores for effecting removal of said contaminant from said hydrocarbonaceous fluid; said carrier material being selected from the group consisting of silica, alumina, magnesia, zirconia, thoria, zinc oxide, chromium oxide, clay, kieselguhr, fuller's earth, pumice, bauxite and combinations thereof; said active material being selected from the group consisting of iron; cobalt; nickel; at least one oxide of the metals of iron, cobalt and nickel; at least one sulfide of said metals; and combinations thereof; and

b. contacting said hydrocarbonaceous fluid with said contaminant-removing material in a reducing atmosphere, in the substantial absence of water, and under an elevated temperature and pressure; whereby at least part of said

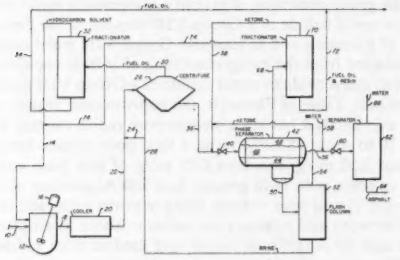
contaminant is removed from said hydrocarbonaceous fluid by way of said particles of contaminant-removing material.

4,069,141

PROCESS FOR RECOVERING FUEL OIL FROM TOPPED CRUDE

Thomas A. Lionetti, Port Arthur; Kenneth D. Miller, Spring, and Levi C. Parker, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,787
Int. Cl.² C10G *21/16*
U.S. Cl. 208—309 **18 Claims**



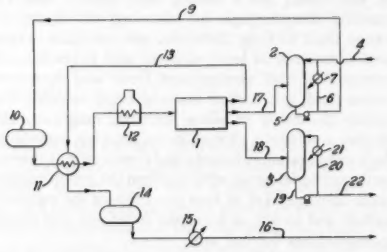
1. A process for recovering fuel oil from a topped crude oil comprising:
   a. admixing said topped crude oil with a hydrocarbon solvent;
   b. centrifuging said mixture of said topped crude oil and said hydrocarbon solvent in the presence of a brine carrier;
   c. recovering a brine-asphalt-fuel oil mixture from said centrifuging step;
   d. admixing said brine-asphalt-fuel oil mixture with a normally liquid ketone solvent selected from the class consisting of aliphatic and alicyclic ketones having at least four carbon atoms;
   e. recovering a ketone rich phase from the mixture produced in step (d); and
   f. recovering said fuel oil from said ketone rich phase.

4,069,142

HYDROCARBON SEPARATING PROCESS

Brian Tait Lauder, Virginia Waters, and John Robert Kenneth Rolfe, Esher, both of England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Aug. 25, 1976, Ser. No. 717,584
Claims priority, application United Kingdom, Sept. 15, 1975, 37746/75
Int. Cl.² C07C *7/13*; C10G *25/10*
U.S. Cl. 208—310 Z **10 Claims**



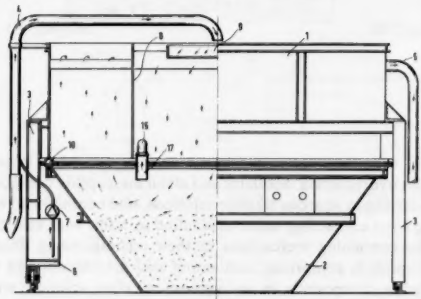
1. A cyclic, vapour phase, pressure swing process for the separation of n-paraffins from a mixture thereof with non-straight chain hydrocarbons comprising the steps of adsorption, purge and desorption, which process comprises
   1. recycling purge effluent mixed with feedstock through a bed of a 5A molecular sieve in an adsorption stage and recovering an effluent of reduced n-paraffin content,
   2. purging the bed to remove surface adsorbed and interstitial matter by reducing the pressure in the bed by direct contact condensation of the purge effluent with fresh feed introduced at or near ambient temperature and recovering said purge effluent-feedstock mixture for recycle to Stage (1), and
   3. desorbing the bed to recover n-paraffins by further reducing the pressure in the bed.

4,069,143

PURIFICATION APPARATUS FOR WATER PURIFICATION AND PURIFICATION SYSTEM THEREFOR

Bernd Friesenborg, Willich, and Helmut Eberhardt, Monchen-Gladbach, both of Germany, assignors to Transportbeton-Beratungs-Gesellschaft mit beschrankter Haftung, Ratingen, Germany

Filed May 25, 1976, Ser. No. 689,861
Claims priority, application Germany, June 6, 1975, 7518028
Int. Cl.² B03B *7/00*
U.S. Cl. 209—10 **2 Claims**



2. A purification system for waste water concentrated with cement and/or lime and additives, with a purification apparatus for water purification with a settling device for sediment, comprising
   a settling device comprising a settling vessel and a separate sediment container,
   said settling vessel and said sediment container being in open connection with one another in assembled condition for purification of water and define a connection plane,
   sealing means for sealing said settling vessel and said sediment container in said connection plane toward the outside,
   said settling vessel and said sediment container being moveable relative to each other for exchange of said sediment container,
   means for separating granular additives from a sediment-water mixture in operative inlet communication with and to said settling vessel,
   a collection vessel means for collecting washing- and industrial- water in outlet communication with and from said settling vessel,
   said means for separating granular additives from the sediment-water mixture comprises,
   vibrating screen means for retaining an overflow of granules larger than 0.2 mm from passing therethrough and for permitting material smaller than 0.2 mm to pass therethrough,
   a supply line means for feeding the material smaller than 0.2

mm passing through said screen means into said settling vessel,

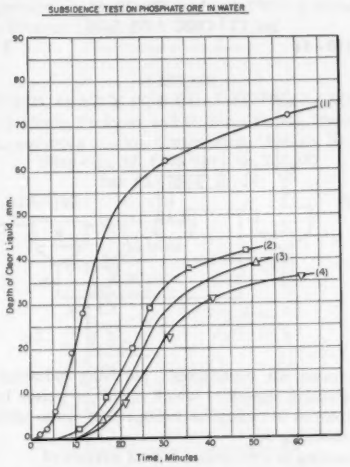
purge means for supplying washing water from said collection vessel means and for spraying same onto said vibrating screen means.

4,069,144

PHOSPHATE ORE RECOVERY

George C. Johnson, Princeton, N.J., and Albert E. Schweizer, Levittown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,535
Int. Cl.[2] B03B 1/02
U.S. Cl. 209—11 **4 Claims**



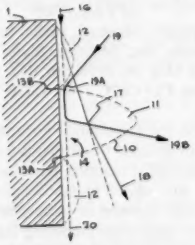
1. An improved process for beneficiating phosphate rock, which process includes at least an acid flotation step and an amine flotation step in which the usual reagents are used, the improvement whereby the mined phosphate rock is dried by a process selected from those consisting of transport, storage or air circulation immediately prior to classification and is mixed with water and classified prior to flotation.

4,069,145

ELECTROMAGNETIC EDDY CURRENT MATERIALS SEPARATOR APPARATUS AND METHOD

Edward J. Sommer, Jr., Nashville, and Garry R. Kenny, College Grove, both of Tenn., assignors to Magnetic Separation Systems, Inc., Nashville, Tenn.

Filed May 24, 1976, Ser. No. 689,663
Int. Cl.[2] B03C 1/22
U.S. Cl. 209—212 **22 Claims**



1. An electromagnetic eddy current materials separator for separating a mixture of feed particles moving along a feedstream according to the electrical conductivities of said particles, comprising

a. an eddy current magnet having a magnet face adjacent the feedstream and a magnet winding for producing a magnetic field adjacent said magnet face upon energization of the winding, said magnetic field having a central spatial zone adjacent said face forming a region of strongest magnetic field influence capable of producing strong eddy current repulsion of material and bordered upstream and downstream relative to the direction of feedstream travel by fringe magnetic field influence zones capable of producing weak eddy current repulsion of materials,

b. magnet activating means responsive to control signals applied thereto and connected to said magnet for producing rapid changes in electrical currents in the magnet winding to activate said magnet at selected times,

c. eddy current magnet control means for producing said control signals,

d. means for directing said mixture of feed particles in the feedstream along a path advancing the feed particles into the region of strongest influence of the magnetic field of said magnet, and

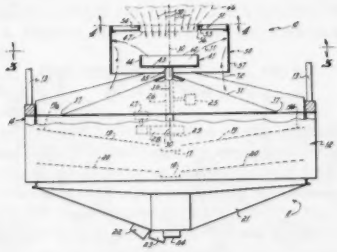
e. repository means for collecting particles repulsed by said eddy current magnet.

4,069,146

DISTRIBUTION OF FEED ONTO A SCREENING MACHINE

William E. Lower, Cincinnati, Ohio, assignor to Rotex, Inc., Cincinnati, Ohio

Filed June 18, 1976, Ser. No. 697,317
Int. Cl.[2] B07B 1/04
U.S. Cl. 209—254 **14 Claims**



1. In a screening machine having a screen, an improved feed distributor for distributing infed material over said screen, said improved distributor comprising,

a dish-shaped, concave thrower, said thrower mounted above said screen and positioned to receive a falling stream of infed material,

a fixed shroud around said thrower, said shroud having a cross-sectional area which is larger than the area of said thrower but smaller than the surface area of said screen,

said thrower being mounted for rotation about a generally vertical axis at a rate such that infed material falling onto said thrower is slung outwardly and upwardly from it to impinge against said shroud by rotation of said thrower,

means for rotating said thrower about said axis,

and a roof positioned above said screen and below said shroud, said roof extending outwardly beyond the shroud so that infed material slung against said shroud drops from said shroud onto said roof, said roof having a peripheral edge from which material dropping onto the roof from said shroud will thereafter drop onto said screen, said roof pesenting a series of vanes extending outwardly toward the peripheral edge thereof, said vanes positioned on said roof to direct material falling onto said roof from said shroud toward said peripheral edge in a predetermined angular distribution,

said screen having a portion which lies outwardly of the peripheral edge of the roof so that material falling over said edge drops onto said portion of the screen.

13. An improved method of distributing an off-center, non-vertical stream of particulate infed material over the screen of a screening machine, said improved method comprising the steps of

discharging said material so that it falls onto a cup-shaped thrower above the screen,

rotating said thrower at a rate such that said particles are slung upwardly and outwardly from said thrower,

interrupting the travel of the particles thus thrown by the thrower by providing a wall around said thrower on which the particles impinge in flight, said wall causing the particles to drop downwardly as an annular stream,

arresting the fall of said particles from said wall by interposing a roof below the wall and over said screen so that said particles fall onto said roof,

directing the particles in desired angular directions on said roof,

and discharging the particles thus directed from the roof onto the screen.

4,069,147

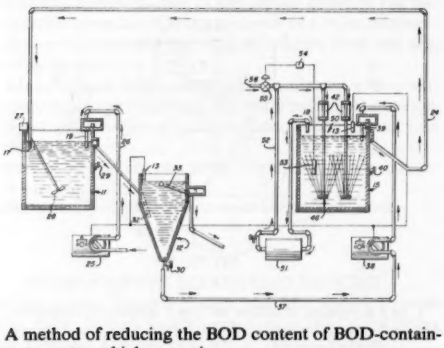
WASTE WATER TREATMENT WITH OXYGEN

Edward Abrams, and Anthony J. Masella, both of Chicago, Ill., assignors to Chemetron Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 507,543, Sept. 19, 1974, abandoned, which is a continuation of Ser. No. 326,441, Jan. 24, 1973, abandoned. This application Aug. 2, 1976, Ser. No. 710,615

Int. Cl.[2] C02C *1/02*

U.S. Cl. 210—6 **14 Claims**



1. A method of reducing the BOD content of BOD-containing waste water which comprises:

contacting influent BOD-containing water in a mixing vessel with an effective amount of a biologically active mass which biologically active mass has metabolized its BOD content, said biologically active mass sorbs BOD from said water to form a BOD-rich biologically active mass and reduces the BOD content of the water without substantial oxygenation of the biologically active mass and with substantially no metabolism of the biologically active mass occurring in said mixing vessel;

transferring the mixture of the BOD-rich biologically active mass and reduced BOD content water to a clarifier;

separating the reduced BOD content water as an effluent from the BOD-rich biologically active mass;

discharging a portion of the BOD-rich biologically active mass from the clarifier;

transferring the remainder of the BOD-rich biologically active mass to a separate oxygenation vessel;

metabolizing the transferred BOD-rich biologically active mass by intimately contacting said biologically active mass in the oxygenation vessel with an oxygen containing gas having an oxygen content of at least 30% by volume to restore the capacity of the sludge to sorb substantial quantities of BOD, and recycling said biologically active mass back to said mixing vessel to contact said BOD-containing water.

4,069,148

INDUSTRIAL WASTE WATER TREATMENT PROCESS

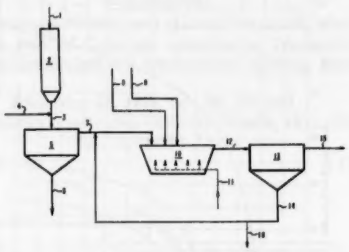
David Glenn Hutton, Newark, and Francis Leonard Robertaccio, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 98,677, Dec. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 2,846, Jan. 14, 1970, abandoned. This application May 27, 1971, Ser. No. 147,398

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.[2] C02C *1/06, 5/10*

U.S. Cl. 210—11 **8 Claims**



1. A process for continuously purifying industrial waste water containing impurities which inhibit or poison bacterial forms employed in biological treatment of waste water, said process consisting of:

A. contacting in a treatment zone a mixture of

1. industrial waste water which has a pH of between about 4 and 11 and which optionally has been subjected to primary treatment to remove solids,

2. biologically active solids in an amount sufficient to provide a total suspended solids content of the mixture of between about 10 and 50,000 parts per million, and

3. activated carbon added at a rate sufficient to supply between about 4 and about 1,000 square meters of surface area of carbon for every liter of waste water supplied to the treatment zone said carbon having a surface area of at least 100 square meters per gram and a particle size such that it will pass through a 200 mesh per inch sieve,

B. mixing a gas containing molecule oxygen through the mixture for a period of at least about 2 hours, and

C. removing the mixture from the treatment zone.

4,069,149

CONTINUOUS FERMENTATION PROCESS AND APPARATUS

Melbourne L. Jackson, Moscow, Idaho, assignor to Idaho Research Foundation, Inc., Moscow, Idaho

Filed May 14, 1976, Ser. No. 686,297

Int. Cl.[2] C02C *1/02;* **C02B** *1/28*

U.S. Cl. 210—44 **6 Claims**

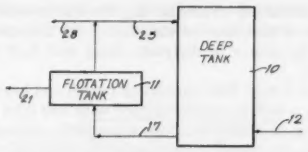
5. An apparatus for continuous fermentation processes involving transfer of gaseous constituents to a liquid material or suspension for biological reaction purposes to produce a solid cellular material and related metabolic products, comprising:

a tall reactor tank exposed to atmospheric pressure;

input means for supplying incoming liquid material or suspension to the interior of the reactor tank;

outlet means for discharging treated liquid suspensions from the interior of the reactor tank at a hydrostatic pressure of at least 13 p.s.i.g.;

a flotation tank exposed to atmospheric pressure and having an inlet;



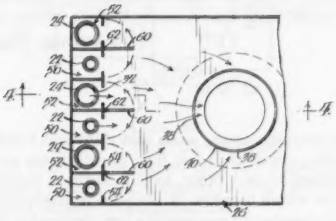
means operatively connecting the outlet means of the reactor tank and the inlet of the flotation tank for suddenly depressurizing the liquid suspension as it is introduced to the flotation tank;

4,069,150

CONTROL DEVICE FOR DUAL FLOW CLARIFIERS

John C. Lodholz, Perkasie, and P. Barry Straus, Hatfield, both of Pa., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 12, 1976, Ser. No. 731,747
Int. Cl.² B01C *21/24*
U.S. Cl. 210—112 **15 Claims**



1. A sludge removal mechanism for withdrawing sludge that has settled to the bottom of a tank comprising a movable concentrating means for concentrating the settled sludge in a plurality of localized areas of the tank bottom, a collection zone located above the tank bottom for receiving settled sludge, a pair of conduits leading from each localized area to said collection zone, a movable plate in said collection zone for each of said pair of conduits and movable between positions to control flow from each localized area to said collection zone, and means for simultaneously moving all of said plates between positions so that flow from a plurality of localized areas is varied simultaneously.

4,069,151

THIN POLYCARBONATE MEMBRANES FOR USE IN HEMODIALYSIS

Willard S. Higley, Glendora; Paul A. Cantor, Los Angeles, and Bruce S. Fisher, Covina, all of Calif., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Mar. 31, 1976, Ser. No. 672,354
Int. Cl.² B01D *31/00*
U.S. Cl. 128—214 R **7 Claims**

1. An improved membrane prepared by a wet phase inversion technique using an aqueous gelation system, said membrane composed of a polyether-polycarbonate block copolymer containing 5 to 35% by weight of repeating alkylene ether carbonate units and from 95 to about 65% by weight of repeating bisphenol A - carbonate units, said membrane being adaptable for use in a hemodialysis apparatus to preferentially remove middle molecular weight molecules from blood, wherein said membrane has a diffusive permeability to sodium chloride of about 800 to 860 cm/min $\times 10^{-4}$, a diffusive permeability to vitamin B_{12} of greater than 105 cm/min $\times 10^{-4}$, an ultrafiltration rate of less than 4.0 ml/hr/M²/mmHg, both the diffusive permeabilities and ultrafiltration rate measured at 37° C, and a thickness of from about 0.60 mil to about 0.95 mil.

7. A method of dialysing a patient comprising
   a. mounting a membrane in a hemodialyzer,
   b. connecting said hemodialyzer to a patient so that blood can be removed from the patient, passed through the hemodialyzer and returned to the patient in a closed loop,
   c. removing blood from a patient;
   d. passing said blood through a hemodialyzer wherein the blood is brought into contact with one face of a membrane mounted within said hemodialyzer while a dialysis liquid is simultaneously circulated through the hemodialyzer in contact with the opposite face of the membrane mounted in the hemodialyzer, the flow rates of the blood and dialysis liquid corresponding to the normal conditions of a hemodialysis process; and returning the dialyzed blood to the patient,

the improvement being the use in the hemodialyzer of a membrane prepared by a wet phase inversion technique using an aqueous gelation system, said membrane composed of a polyether-polycarbonate block copolymer having a molecular weight within the range of from about 200,000 to 500,000 as determined by intrinsic viscosity measurement, containing 5 to 35% by weight of repeating alkylene ether carbonate units and from 95 to about 65% by weight of repeating bisphenol A - carbonate units, said membrane having a diffusive permeability measured at 37° C to sodium chloride of about 800 to 860 cm/min $\times 10^{-4}$, a diffusive permeability to vitamin B_{12} measured at 37° C of greater than 105 cm/min $\times 10^{-4}$, an ultrafiltration rate measured at 37° C less than 4.0 ml/hr/M²/mmHg and a thickness of from about 0.6 mil to about 0.95 mil.

4,069,152

CLARIFICATION OF CLAY CONTAINING WATER

Gerald A. Specken, 10719 Hardisty Drive, Edmonton, Alberta, Canada

Filed Apr. 26, 1976, Ser. No. 680,026
Int. Cl.² C02B *1/20*
U.S. Cl. 210—50 **17 Claims**

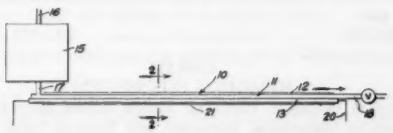
1. A process for the clarification of clay-containing water, said water being selected from the group consisting of water from processing of bitumnous sands and water from oil or gas well drilling sites, said water containing between about 500 to about 100,000 ppm by weight of suspended clay particles, including treating the water with between about 0.5 to about 500 ppm of an alkali permanganate to cause coagulation and subsequent settling of substantially all said suspended clay particles.

4,069,153

METHOD OF DESTROYING PYROGENS

Donald A. Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Continuation of Ser. No. 625,821, Oct. 28, 1975, abandoned. This application Nov. 4, 1976, Ser. No. 738,925
Int. Cl.² C02B *3/00*
U.S. Cl. 210—64 **2 Claims**



1. A method of providing a continuous flow of physiologically safe water comprising,
   providing a continuous flow of water containing lipopolysaccharides known as pyrogens,
   treating said water containing said lipopolysaccharides with ultra-violet light of a wave length and dosage sufficient to

chemically alter substantially all pyrogens in said water to destroy substantially all pyrogenicity of said water,

said ultra-violet light being of a wave length of 1800A to 2000A at a dosage in the order of 100,000 to 300,000 microwatt-seconds per square centimeter of area of said flow path,

with all said water flowing within 6 millimeters of said light,

thereby converting a substantial amount of oxygen dissolved in said water to ozone, and

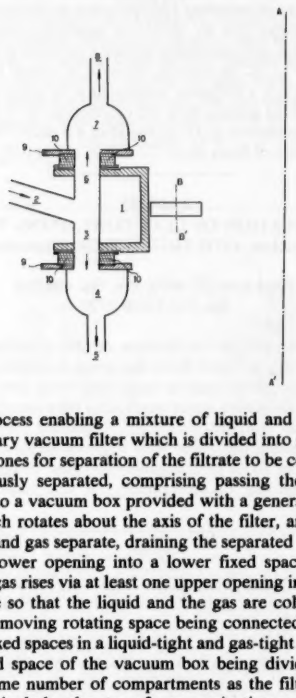
whereby said pyrogen destruction is enhanced and substantially all pyrogenicity of said water is destroyed and said water is safe for physiological use.

4,069,154

VACUUM FILTRATION PROCESS EMPLOYING A CIRCULAR VACUUM BOX

Michel Barloy, Rouen, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Sept. 25, 1975, Ser. No. 616,559
Claims priority, application France, Oct. 3, 1974, 74 33316
Int. Cl.[2] B01D *37/00*
U.S. Cl. 210—66 **6 Claims**



1. A process enabling a mixture of liquid and gas coming from a rotary vacuum filter which is divided into a number of filtration zones for separation of the filtrate to be collected and simultaneously separated, comprising passing the liquid/gas mixture into a vacuum box provided with a generally circular space which rotates about the axis of the filter, and in which the liquid and gas separate, draining the separated liquid via at least one lower opening into a lower fixed space while the separated gas rises via at least one upper opening into an upper fixed space so that the liquid and the gas are collected separately, the moving rotating space being connected to the two adjacent fixed spaces in a liquid-tight and gas-tight manner, the lower fixed space of the vacuum box being divided radially into the same number of compartments as the filtration zone and which includes the step of communicating each compartment with a filtration zone so that each filtrate is separate from the gas.

4,069,155

HEMODIALYSIS SYSTEM

Yasuhiro Tsujimoto, Toyonaka; Junichi Azuma, Hirakata; Yoshihiko Matsumura, Kawanishi, and Katsumi Noda, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed June 1, 1976, Ser. No. 692,024
Claims priority, application Japan, May 29, 1975, 50-65105
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—195 R **13 Claims**

1. A dialysate circulating system which can be made into a hemodialysis system by the addition of a dialyzer, said circulating system comprising, in combination:

a source of dialysate;

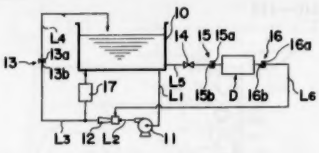
a fluid circulating circuit having one end connected to said source of dialysate for circulating the dialysate supplied from the source of dialysate along said fluid circulating circuit;

an ejector in said fluid circulating circuit and having an inlet nozzle, a diffuser axially aligned with said inlet nozzle and defining an orifice in cooperation with said nozzle and a suction chamber in communication with said orifice, said ejector being positioned in said circulating circuit for directing the dialysate being circulated from the nozzle into the diffuser for developing a negative gauge pressure in said suction chamber;

first and second mating coupling members in said fluid circulating circuit connectable to each other and being disposed in said circulating circuit downstream of said ejector in terms of the direction of flow of the dialysate;

a fluid circuit means connected between said source of dialysate and said suction chamber of said ejector; and

third and fourth mating coupling members in said fluid circuit means connectable to each other,



said circulating system, when said third and fourth mating coupling members in said fluid circuit means are directly connected to each other, having therein a dialyzer of the type in which blood to be dialyzed is pumped through a blood chamber on one side of a semi-permeable membrane under a positive gauge pressure and dialysate is pumped through a dialysate chamber on the other side of the membrane under a pressure approximating or equal to atmospheric pressure with the opposite ends of the dialysate chamber connected between the first and second mating coupling members in said fluid circulating circuit and when the first and second mating coupling members are directly connected to each other, having therein a dialyzer of the type in which blood to be dialyzed is allowed to flow under the natural pressure thereof through a blood chamber on one side of a semi-permeable membrane and dialysate is caused to flow through dialysate chamber on the other side of the membrane under negative gauge pressure with the opposite ends of the dialysate chamber connected between the third and fourth coupling members in said fluid circuit means.

4,069,156

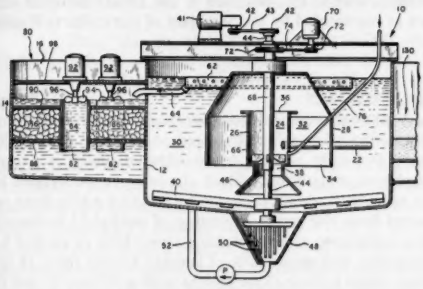
SEWAGE TREATMENT SYSTEM

Donald G. Mason, Overland Park, Kans., assignor to Ecodyne Corporation, Chicago, Ill.

Filed July 5, 1974, Ser. No. 485,899
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—195 S **6 Claims**

1. Improved apparatus for purifying a liquor containing a biodegradable material comprising: means defining a clarification zone; means for delivering said liquor to said clarification zone; means defining an oxidation/nitrification zone; a first bed of media in said oxidation/nitrification zone, said media comprising a multiplicity of submerged elements freely and randomly stacked on one another to provide interstitial area therebetween, said elements having a high surface area to volume ratio; aeration means in said oxidation/nitrification zone for introducing air into said liquor; means for delivering said liquor from said clarification zone to said oxidation/nitrification

zone; means for delivering liquor through said first bed of media; means defining a denitrification zone; a second bed of said media in said denitrification zone; means for delivering said liquor through said second bed of media; means for delivering said liquor from said oxidation/nitrification zone to said



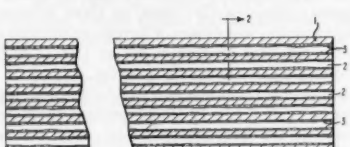
denitrification zone; means for introducing a nutrient into said second bed of media; and means for withdrawing said liquor from said denitrification zone, said oxidation/nitrification zone, said denitrification zone, and said filter means being positioned around the perimeter of said clarification zone to form a single, compact unit.

4,069,157

ULTRAFILTRATION DEVICE

Fred Wayne Hoover, Wilmington, Del., and Robert Earl Roberts, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 20, 1975, Ser. No. 633,836
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—433 M **8 Claims**



1. An ultrafiltration device comprising an integral support of porous ceramic material having substantially uniformly spaced and axially parallel passageways formed therein and a permselective membrane coated onto the surface of the passageways wherein:

a. the surface area (SA) of the passageways in the porous support is about from 300 to 2,000 square meters per cubic meter of support;

b. the pores in the support have diameters of about from 2 to 20 microns and the decimal proportion of the volume of the pores of the element material to the total volume occupied by the material (PV) is about from 0.30 to 0.60;

c. the decimal proportion of the volume of the support material exclusive of the passageways to the total volume of the support (SV) is about from 0.40 to 0.75; and

d. the permeability factor (PF) of the support, defined as PF = PV × SV/SA, is greater than about 1.0 × 10−4 meter.

4,069,158

FIRE EXTINGUISHING COMPOSITIONS

Rene Bertocchio, Vernaisson, and Louis Foulletier, Oullins, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Apr. 21, 1976, Ser. No. 678,929
Claims priority, application France, Apr. 25, 1975, 75 12981
Int. Cl.[2] A62C *1/00;* **B01F** *17/30*
U.S. Cl. 252—3 **12 Claims**

1. An aqueous fire-extinguishing composition comprising an aqueous solution of a mixture of (a) from about 5 to 45 percent of a nonionic surface-active agent, (b) from about 5 to 55 percent of a fluorinated amphoteric surface active agent, and (c) from about 30 to 60 percent of a cationic aromatic fluorinated surface-active agent of formula

$$\left[C_nF_{2n+1}-CH_2-CH_2-N\begin{matrix}R'\\R''\\R'''\end{matrix} \right]^+ A^-$$

in which; C_nF_{2n+1} represents a straight or branched perfluoro chain were n is a whole number between 1 and about 20; A is an anion; R′, R″ and R‴ are defined as follows:

1. R′ and R″ may be identical or different, and are alkyl radicals containing 1 to 8 carbon atoms, and wherein R‴ is an aryl radical or an arylalkyl radical containing 1 to 8 carbon atoms in the alkyl chain, or the aromatic derivative of a hydroxyalkyl radical containing between 1 and about 8 carbon atoms;
2. R′ is an alkyl radical containing 1 to 8 carbon atoms, and R″ and R‴ together constitute a divalent radical linked to the nitrogen atom by two single bonds derived from alkyl, alkenyl or dienic groups containing 4 to 9 atoms and carrying or containing aromatic substituents or radical;
3. R′, R″ and R‴ together constitute the residual part of a tertiary aromatic amine derived from pyridine or pyridine derivatives and containing 5 to 18 carbon atoms.

4,069,159

ANTISTAT AND SOFTENER FOR TEXTILES

Mason Hayek, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1976, Ser. No. 654,279
Int. Cl.[2] D06M *13/46*
U.S. Cl. 252—8.8 **3 Claims**

1. An antistatic agent for textiles comprising a mixture of:

a. a condensate of stearic acid and diethanolamine quaternized with dimethyl sulfate, and

b. lithium chloride; the weight ratio of (a) and (b) being from 1.0/10 to 10/1.0.

4,069,160

TEXTURING FINISH FOR SYNTHETIC FILAMENTS

Roland L. Hawkins, Spartanburg, S.C., assignor to Hoechst Fibers Industries, Division of American Hoechst Corporation, Spartanburg, S.C.

Filed Jan. 20, 1975, Ser. No. 542,683
Int. Cl.[2] D06M *13/16, 13/20, 13/26*
U.S. Cl. 252—8.9 **16 Claims**

1. A finish composition for synthetic textile filaments comprising:

a. about 40 to about 75 weight percent of a high molecular weight fatty acid ester lubricant characterized by a weight loss of not more than 25 weight percent when subjected to a temperature of 210° C. for 24 hours;

b. about 20 to about 50 weight percent of an emulsifier for said lubricant, said emulsifier having a low fuming propensity and being stable against thermal degradation;

c. about 2 to about 20 weight percent of a neutralized phosphated adduct of an alcohol containing from about 8 to

about 18 carbon atoms and about 4 to about 10 moles of ethylene oxide; and

d. 0 to about 2 weight percent of a thermal stabilizer.

4,069,161

PREPARATION OF AQUEOUS SOLUTIONS OF POLYACRYLAMIDES

Richard J. Pogers, 1570 Detroit, Denver, Colo. 80206

Division of Ser. No. 320,789, Jan. 3, 1973, Pat. No. 3,868,997. This application June 24, 1974, Ser. No. 482,811

Int. Cl.[2] E21B *43/22;* B01F *1/00*

U.S. Cl. 252—8.55 D 5 Claims

1. In a process for the production of aqueous solutions of polymer, the improvement comprising:

a. chilling, until frozen, a gel of a polymer selected from the group consisting of polyacrylamide, hydroxyethyl cellulose, vinyl acetate-crotonic acid polymer, and polyvinyl acetate/polyvinyl pyrrolidone to within a temperature range of about −30 to about −320° F.,

b. grinding the gel while chilled to form frozen particles of the polymer having an average particle size in the range of from about 250 to about 1000 microns,

c. dissolving the ground particles of the polymer gel in water.

4,069,162

HAZE FREE OIL ADDITIVE COMPOSITIONS CONTAINING POLYMERIC VISCOSITY INDEX IMPROVER AND PROCESS FOR PRODUCING SAID COMPOSITIONS

John Brooke Gardiner, Mountainside; Max W. Hill, Westfield, and Jack Ryer, East Brunswick, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 3, 1975, Ser. No. 628,342

Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—32.7 E 7 Claims

1. A process of decreasing haze in a composition comprising:

a major amount of hydrocarbon lubricating oil;

in the range of about 5 to 30 wt. %, based upon the total weight of said composition, of an oil-soluble viscosity index improver polymer which consists essentially of about 30 to 80 wt. % ethylene and propylene, said polymer being formed by a Ziegler-Natta polymerization, said polymer having a M_n in the range from 700 to 500,000 and a M_w/M_n ratio of less than 10; and

a haze forming amount, but less than 1 wt. %, based on the total weight of said composition, of an oil insoluble, haze forming material resulting from the manufacture of said polymer, which material is a disassociable metal salt of a weak organic acid having a pK of more than about 3.8, and wherein said metal is selected from the class consisting of alkaline earth metal, zinc, sodium, potassium, aluminum, vanadium, chromium, iron, manganese, cobalt, nickel, cadmium, lead, bismuth and antimony;

which process comprises adding to said composition about 0.1 to about 2.5 equivalents, per equivalent of metal of said haze forming material, of an oil soluble hydrocarbyl substituted strong acid containing a hydrogen disassociating moiety and having a pK of less than about 2.5, and reacting for about 0.1 to about 20 hours at room temperature to about 250° C. said strong acid with said haze forming material to thereby decrease haze by converting said haze forming material either to an oil soluble weak acid or a volatile product, while converting the metal into an oil soluble strong acid metal salt and/or ionic complex of said strong acid, wherein said strong acid is selected from the group consisting of maleic acid, malonic acid, phosphoric acid, thiophosphoric acids, phosphonic acid, thiophosphonic acids, phosphinic acid, thiophosphinic acids, sulfonic acid, sulfuric acid, and alpha-substituted halo- or nitro- or nitrilo-carboxylic acids; and wherein the oil solubilizing hydrocarbyl group or groups of said strong acid contain from about 6 to about 40 carbon atoms.

4,069,163

LUBRICANT COMPOSITION

Harold E. Kenney, Jenkintown, and Edward T. Donahue, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 30, 1976, Ser. No. 701,057

Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—46.7 10 Claims

1. A lubricant composition comprising a major proportion of a lubricating oil to which has been added from about 0.06 to about 2.0 weight percent of an additive which is a partial phosphorus pentasulfide adduct of a polycyanoethylated keto fatty ester, said adduct prepared by reacting a keto fatty ester selected from the group consisting of methyl-12-ketostearate and a mixed keto ester containing about 85% of methyl 9,10-ketostearate and about 15% of ketones having from 14 to 20 carbon atoms in their chain lengths with acrylonitrile and then reacting the resultant polycyanoethylated keto fatty ester with phosphorus pentasulfide at a molar ratio of about 7 to 1, respectively, at about 100° C for about 1 hour until about one-half of the cyanoethyl groups are reacted.

4,069,164

PROCESS FOR PRODUCING FERROMAGNETIC POWDER

Shin-ichiro Dezawa; Koji Sasazawa, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 1, 1976, Ser. No. 701,914

Claims priority, application Japan, July 2, 1975, 50-82075

Int. Cl.[2] C01G *49/06, 49/08;* G11B *5/64*

U.S. Cl. 252—62.62 22 Claims

1. A process for producing a cobalt containing ferromagnetic iron oxide which consists essentially of adding an aqueous solution containing Co^{+2} ions, an alkali solution, and an oxidizing agent to a suspension of ferromagnetic iron oxide and heating the resultant mixture at 80° to 150° C to form said cobalt containing ferromagnetic iron oxide;

the amount of Co^{+2} ions in said Co^{+2} ion containing aqueous solution being 0.5 to 10 atomic percent based on the iron present in the ferromagnetic iron oxide; the amount of alkali present in said alkali solution being such that after neutralization of the Co^{+2} ions, the hydroxyl concentration of said mixture is at least 0.5 N; the amount of oxidizing agent, when it is a liquid or solid, being at least about 0.1 equivalent based on the Co^{+2} ions and when it is a gas, said oxidizing agent being added at a rate of at least 0.1/min per liter of said resultant mixture.

17. A process for producing a cobalt containing ferromagnetic iron oxide which consists essentially of adding an aqueous solution containing Co^{+2} ions and at least one cation selected from the group consisting of Cr^{+3}, Cr^{+6}, Mn^{+2}, Ni^{+2} and Zn^{+2}; an alkali solution; and an oxidizing agent to a suspension of ferromagnetic iron oxide and heating the resulant mixture at 80° to 150° C to form said cobalt containing ferromagnetic iron oxide;

the amount of Co^{+2} ions and said cation in Co^{+2} and cation containing solution being 0.5 to 10 atomic percent based on the iron present in the ferromagnetic iron oxide and the ratio of Co^{+2} ion to said catioin being such that at last ½ of said 0.5 to 10 atomic percent is Co^{+2} ion, the amount of alkali in said alkali solution being such that after neutralization of the Co^{+2} ions and aid cation the hydroxyl ion concentration is at least 0.5 N; the amount of oxidizing agent when it is a liquid or solid is at least 0.1 equivalent based on said Co^{+2} ions and when it is a gas it is added at

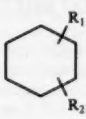
a rate of at least about 0.1 l./min per liter of said resulant mixture.

4,069,165
ELECTRICAL INSULATING OILS

Midori Masunaga, Tokyo; Yoshiki Kohno, Kawasaki, and Kohji Hayashi, Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Mar. 31, 1976, Ser. No. 672,375
Claims priority, application Japan, Apr. 9, 1975, 50-42232
Int. Cl.[2] H01B *3/22*
U.S. Cl. 252—63 12 Claims

1. An electrical insulating oil having excellent thermal stability, electrical properties, low pour point and corona resistance, consisting essentially of (1) 50–97 parts by weight of a mineral oil containing not more than 0.35 wt.% of sulphur and being prepared by refining with a solvent for selective dissolution of aromatic compounds a distillate containing at least 80 wt.% of a fraction having a boiling range of 230°–430° C at atmospheric pressure and being obtained by the distillation of a paraffin or mixed base crude oil, said solvent refining also effecting the removal of 30–85 wt.% of the sulphur contained in the distillate, thereby to obtain a raffinate, hydrofining the thus obtained raffinate, and then dewaxing the thus hydrofined raffinate with a solvent for dewaxing, and (2) 3–50 parts by weight of at least one alkylbenzene represented by the formula



in which R_1 and R_2 are each hydrogen or a hydrocarbon residue having 1–20 carbon atoms, and the total of carbon atoms contained R_1 and R_2 is at least 9.

4,069,166
ELECTRICAL INSULATING OILS

Midori Masunaga, Tokyo; Yoshiki Kohno, Kawasaki, and Hiroshi Hasegawa, Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed June 15, 1976, Ser. No. 696,249
Claims priority, application Japan, June 20, 1975, 50-74406; Feb. 12, 1976, 51-13152
Int. Cl.[2] H01B *3/22*
U.S. Cl. 252—63 13 Claims

1. An electrical insulating oil consisting essentially of (A) 80–99 parts by weight of a refined oil (I) containing not more than 0.25 wt.% of sulphur and 18–30 wt.% of aromatic compounds, the refined oil (I) being produced by the steps of:

refining with a solvent capable of selectively dissolving aromatic compounds a distillate contained in a fraction having a boiling range of 230°–430° C at atmospheric pressure obtained by the distillation of a paraffin or mixed base crude oil at atmospheric pressure or the distillation at a reduced pressure of a bottom oil obtained by the distillation of the crude oil at atmospheric pressure thereby to obtain a raffinate from said distillate,

hydrofining the raffinate so obtained and

dewaxing the thus hydrofined raffinate with a solvent, and (B) 1–20 parts by weight of a refined oil (II) having an aromatic content of 14 to 29% and lower than that of the refined oil (I), the refined oil (II) being prepared by treating at least with a solid adsorbent a lubricating oil fraction of a mineral oil having a boiling range of 230°–460° C at atmospheric pressure obtained from a crude oil, to obtain the electrical insulating oil having a total sulphur content of not more than 0.35 wt.% and excellent thermal stability.

4,069,167
LIQUID CRYSTAL COMPOSITION

Takashi Inukai; Hideo Sato, and Tetsuya Ishibe, all of Yokohama, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sept. 10, 1975, Ser. No. 611,944
Claims priority, application Japan, Sept. 25, 1974, 49-110767; Sept. 25, 1974, 49-110765
Int. Cl.[2] C09K *3/34;* G02F *1/13*
U.S. Cl. 252—299 11 Claims

1. A liquid crystal composition having a liquid crystal temperature range encompassing the range of −10° C to 60° C, comprising in combination

a. at least one component selected from the group consisting of

a_1. 4-cyano-4″-n-pentylterphenyl in an amount within the range of 4 to 8 mol %, and

a_2. 4-cyano-4″-hexylterphenyl, in an amount within the range of 4 to 8 mol%,

b. at least two components selected from the group consisting of

b_1. 4-cyano-4′-n-pentylbiphenyl, in an amount between 10 to 45 mol%,

b_2. 4-cyano-4′-n-heptylbiphenyl in an amount between 10 to 45 mol %, and

b_3. 4-cyano-4′-n-hexylbiphenyl in an amount between 10 to 45 mol %,

the total amount of said at least two components being within the range of 50 to 75 mol %, and

c. at least three components selected from the group consisting of

c_1. 4-cyano-4′-n-propyloxybiphenyl, 3.5–13 mol %,

c_2. 4-cyano-4′-n-butyloxybiphenyl, 3.5 – 13 mol %,

c_3. 4-cyano-4′-n-pentyloxybiphenyl, 3.5 – 13 mol %,

c_4. 4-cyano-4′-n-hexyloxybiphenyl, 3.5 – 13 mol %,

c_5. 4-cyano-4′-n-heptyloxybiphenyl, 3.5 – 13 mol %, and

c_6. 4-cyano-4′-n-octyloxybiphenyl, 3.5 – 13 mol %,

the total amount of said at least three components being within the range of 20 – 38 mol %,

all of the above mol percentages being based on the total composition and the total mol% always being 100.

4,069,168
TUNGSTEN HEXACARBONYL IN PLASTIC LENSES

I. Roger Leatherman, Wadsworth, and Michael S. Misura, Barberton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1976, Ser. No. 728,561
Int. Cl.[2] G02B *5/23*
U.S. Cl. 252—300 15 Claims

1. A liquid composition comprising a mixture of allyl glycol carbonate monomer and sufficient tungsten hexacarbonyl to provide a photochromic polymerizate that become blue and has substantial infrared absorbance upon exposure to ultraviolet radiation.

5. A solid poly(ally glycol carbonate) photochromic polymerizate article having tungsten hexacarbonyl uniformly incorporated therein, said article becoming blue and having substantial infrared absorbance upon exposure to ultraviolet radiation.

4,069,169

PROCESS FOR PREPARATION OF CATALYST COMPONENT SUPPORTED ON HIGH PERFORMANCE CARRIER

Akinori Toyoda, Ohtake, and Norio Kashiwa, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 634,332, Nov. 24, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,236

Int. Cl.[2] B01J *31/02, 31/12, 27/06*

U.S. Cl. 252—429 B **9 Claims**

1. A process for preparing a catalyst component supported on a carrier, which comprises contacting in a treatment liquid (A) a titanium tetrahalide in the liquid or gaseous phase with (B) a solid in the absence of mechanical pulverization, at a temperature of 40° C to the boiling point of the treatment liquid, to thereby chemically bond the titanium tetrahalide (A) to the solid (B), said solid (B) being obtained by either

1. mechanically pulverizing an adduct of a magnesium dihalide with a monocyclic aromatic monocarboxylic acid ester;
2. mechanically pulverizing a magnesium dihalide and an adduct of a magnesium dihalide with a monycyclic aromatic momocarboxylic acid ester;
3. mechanically pulverizing a monocyclic aromatic monocarboxylic acid ester and at least one magnesium dihalide component selected from the group consisting of magnesium dihalides and adducts thereof with monocyclic aromatic monocarboxylic acid esters;
4. mechanically pulverizing a magnesium dihalide and a complex of a titanium compound of the formula

$$Ti(OR)_nX_{4-n}$$

wherein R is an alkyl radical, or a phenyl radical optionally substituted by a lower alkyl group, X is a halogen atom, and n is an integer of 0 to 4, with a monocyclic aromatic monocaroxylic acid ester;
5. mechanically pulverizing an adduct of a magnesium dihalide with a monocyclic aromatic monocarboxylic acid ester and at least one titanium component selected from the group consisting of titanium compounds of the formula

$$Ti(OR)_nX_{4-n}$$

wherein R is an alkyl radical, or a phenyl radical optionally substituted by a lower alkyl group, X is a halogen atom, and n is an integer of 0 to 4, and complexes thereof with monocyclic aromatic monocarboxylic acid esters;
6. mechanically pulverizing a magnesium dihalide, an adduct of a magnesium dihalide with a monocyclic aromatic monocarboxylic acid ester, and at least one titanium component selected from the group consisting of titanium compounds of the formula

$$Ti(OR)_nX_{4-n}$$

wherein R is an alkyl radical, or a phenyl radical optionally substituted by a lower alkyl group, X is a halogen atom, and n is an integer of 0 to 4, and complexes thereof with monocyclic aromatic monocarboxylic acid esters; or
7. mechanically pulverizing a monocyclic aromatic monocarboxylic acid ester, at least one magnesium dihalide component selected from the group consisting of magnesium dihalides and adducts thereof with monocyclic aromatic monocarboxylic acid esters, and at least one titanium component selected from the group consisting of titanium compounds of the formula

$$Ti(OR)_nX_{4-n}$$

wherein R is an alkyl radical, or a phenyl radical optionally substituted by a lower alkyl group, X is a halogen atom, and n is an integer of 0 to 4, and complexes thereof with monocyclic aromatic monocarboxylic acid esters, wherein the amounts of the magnesium dihalide (a), the monocyclic aromatic monocarboxylic acid ester (b) and the titanium compound (c) of the above formula are selected such that the molar ratio of (a):(b) in (1), (2) and (3) above is 1:10 to 0.005 and the molar ratio of (a):(b):(c) in the case of (4), (5), (6) and (7) above is 1: (10 to 0.005):(100 to 0.001), and wherein when the adduct of magnesium dihalide or the complex of titanium compound is used, the amount of the monocyclic aromatic monocarboxylic acid ester therein is considered as the amount of (b) and wherein said monocyclic aromatic monocarboxylic acid ester (b) is an ester of benzoic acid, hydroxybenzoic acid, alkoxy benzoic acid or alkyl benzoic acid.

4,069,170

FLUIDIZED DEOXYCHLORINATION CATALYST COMPOSITION

Robert J. Blake, Oakland, and Guy W. Roy, Richmond, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 601,744, Aug. 4, 1975, abandoned, which is a continuation of Ser. No. 418,494, Nov. 23, 1973, abandoned, which is a continuation of Ser. No. 212,793, Dec. 27, 1971, abandoned, which is a division of Ser. No. 772,395, Oct. 31, 1968, Pat. No. 3,657,367. This application Dec. 13, 1976, Ser. No. 750,027

Int. Cl.[2] B01J *27/06*

U.S. Cl. 252—441 **4 Claims**

1. In a fluidized bed oxychlorination catalyst composition disposed upon an alpha-alumina support therefore which comprises a catalytically effective percentage of copper chloride, an oxidation inhibitor selected from the group consisting of sodium chloride and potassium chloride and between about 0.1 and about 12 percent by weight didymium chloride based upon the total weight of catalyst composition and support, the improvement comprising adding to the catalyst composition between about 0.2 to about 6 percent by weight additional lanthanum chloride above and beyond that lanthanum chloride contained in the didymium chloride.

4,069,171

METALLIC FIBROUS SKELETAL CATALYSTS AND PROCESS FOR PRODUCING THEM

Franklin D. Lemkey, Glastonbury, and Gerald S. Golden, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 12, 1976, Ser. No. 741,831

Int. Cl.[2] B01J *21/04, 35/06*

U.S. Cl. 252—454 **9 Claims**

1. Active catalytic material which comprises a plurality of porous single crystal metallic fibers of high surface area comprising metals selected from the group consisting of the IB metals, the IVB metals, the VB metals, the VIB metals, the VIIB metals, and the VIII metals.

4,069,172

ADSORBENT FOR AROMATIC HYDROCARBON MIXTURE SEPARATION

Masazumi Kanaoka; Daisuke Ogawa; Kazuyoshi Iwayama, and Makoto Kihara, all of Yokohama, Japan, assignors to Toray Industries, Inc., Nihonbashi-Muromachi, Japan

Filed Mar. 15, 1976, Ser. No. 667,075

Claims priority, application Japan, Mar. 17, 1975, 50-31093

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **7 Claims**

1. An adsorbent for separating paraisomers from C_8 or C_{10} aromatic hydrocarbons, or mixtures thereof, which is obtained by drying and calcining a faujasite zeolite including: (1) ammonium ions in the range of 2.5 to 25%, based on the total exchangeable cation sites originally present, and (2) ions selected

from the group consisting of potassium and barium ions at the residual cation sites.

6. The adsorbent defined in claim 5, wherein said initial faujasite type zeolite contains oxides of sodium, aluminum and silica according to the formula

$$1.1 - 0.7\ Na_2O : Al_2O_3 : 2\text{-}7\ SiO_2 : XH_2O.$$

4,069,173

FIRE RETARDANT POLYISOCYANURATE AND POLYURETHANE FOAMS HAVING REDUCED SMOKE LEVELS AND METHOD FOR PRODUCING SAME

William J. Kauffman, Manheim, and Edwin J. Quinn, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 23, 1976, Ser. No. 679,688
Int. Cl.² C08G *18/28;* C08K *5/09*
U.S. Cl. 260—2.5 AJ **9 Claims**

1. Polyisocyanurate and polyurethane foams characterized by reduced smoke levels when burned comprising

a foam material selected from the group consisting of polyisocyanurate and polyurethane foams, and

an acid incorporated in said foam in an amount sufficient to reduce smoke levels of said foam when said foam is burned, said acid being selected from the group consisting of

a. polycarboxylic cycloaliphatic acids having 3 non-adjacent carboxylic acid groups or any configuration with more than 3 carboxylic acid groups up to and including acids containing one carboxylic acid group per carbon atom,

b. polycarboxylic heterocycloaliphatic acids having 3 non-adjacent carboxylic acid groups or any configuration with more than 3 carboxylic acid groups up to and including acids containing one carboxylic acid group per carbon atom,

c. polycarboxylic naphthalenic acids having 3 non-adjacent carboxylic acid groups or any configuration with more than 3 carboxylic acid groups up to and including acids containing one carboxylic acid group per *n*-2 carbon atoms, where n = total number of carbon atoms in the ring system, and

d. mixtures of said acids.

4,069,174

CURED OR UNCURED COMPOSITIONS OF HOMO- OR COPOLYMERS OF EPIHALOHYDRINS

Tetsuya Nakata, Ibaragi; Sachio Shimogawa, Amagasaki; Akira Hashimoto, Itami, and Nobuo Yamada, Amagasaki, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

Filed Feb. 19, 1975, Ser. No. 550,998
Claims priority, application Japan, Feb. 20, 1974, 49-20138
Int. Cl.² C08G *65/32*
U.S. Cl. 260—2 A **28 Claims**

1. A cured or uncured composition consisting essentially of:

I. a polymer which is

A. an epihalohydrin homopolymer, or

B. an epihalohydrin copolymer of:

1. at least 5 mol% of an epihalohydrin monomer; and

2. the remainder being at least one monomer selected from the group consisting of an epihalohydrin other than (1), copolymerizable epoxides other than epihalohydrin, and 5-membered dicarboxylic acid anhydrides; and

II. a curing agent and acid acceptor consisting essentially of, on a basis of 100 parts by weight of polymer I:

A. from about 0.1 to about 100 parts by weight of a cyclic carboxylic acid anhydride;

B. from about 0.1 to about 10 parts by weight of a compound selected from the group consisting of 1,8-diazabicyclo (5,4,0) undecene-7 and salts thereof; and

C. from about 0.5 to about 20 parts by weight of at least one metal compound selected from the group consisting of: the oxide, hydroxide, carbonate and carboxylic acid salt of a metal of Group II of the Periodic Table of elements; and the oxide, basic carbonate, basic carboxylic acid salt and basic phosphite of a metal of Group IV-A of the Periodic Table.

4,069,175

METHOD FOR PRODUCING DIMENSIONALLY STABLE UREA-FORMALDEHYDE FOAMS

William Percy Moore, Hopewell, Va., assignor to Waverly Chemical Co., Hopewell, Va.

Filed Jan. 21, 1977, Ser. No. 761,301
Int. Cl.² C08V *9/30*
U.S. Cl. 260—2.5 F **1 Claim**

1. A method for producing dimensionally stable urea-formaldehyde foam which comprises an aqueous neutral urea-formaldehyde resin having a formaldehyde to urea mol ratio of about 2, a viscosity of about 40 centipoise and a solids content between 40 and 65%, combining the said resin with frothed curing solution containing about 1% sulfuric acid and about 2% surfactant and having an electrical conductivity of at least 0.1 $ohm^{-1}centimeter^{-1}$, continuously blending the combined resin and curing solution foam with a substantially un-ionized liquid suspension having an electrical conductivity lower than 0.00001 $ohms^{-1}centimeter^{-1}$ and containing between 10 and 25% attapulgite clay sized to pass through a 325 mesh Tyler Screen, curing and drying the combined foam at temperatures between 0° C and 35° C.

4,069,176

PROCESS FOR PRODUCING DYED FINELY DIVIDED HARDENED BENZOGUANAMINE RESINS HAVING UNIFORM PARTICLE SIZE AND EXCELLING IN DISPERSIBILITY

Tsuneo Tsubakimoto; Iwao Fuzikawa, both of Toyonaka; Katsumi Uchida, Shimamoto, and Osamu Minamidani, Higashiosaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed July 12, 1976, Ser. No. 704,744
Claims priority, application Japan, July 30, 1975, 50-91935
Int. Cl.² C08K *3/36*
U.S. Cl. 260—39 P **11 Claims**

1. A process for producing a dyed finely divided hardened resin of uniform particle size excelling in dispersibility which comprises, in combination, the steps of reacting benzoguanamine with formaldehyde in a ratio of 1.0 mole of the former to 1.2 - 3.5 moles of the latter in an aqueous medium at a pH ranging between 5 and 10 to prepare an aqueous liquid of a soluble and fusible resin having a degree of modified water tolerance of 0 - 150%, preparing an aqueous emulsion of a dyed soluble and fusible resin by using said aqueous liquid, a dye and a protective colloid, adding to the thus prepared aqueous emulsion in a ratio of 1 - 15 parts by weight per 100 parts by weight of the soluble and fusible resin of ultramicroscopic silica of a specific surface area as measured by the Brunauer, Emmett and Teller Method in the range of about 50 m^2/g to about 400 m^2/g and a particle size in the range of about 0.005 to about 0.05 micron, adding a curing catalyst, holding the aqueous emulsion for at least one hour at a temperature in the range of 40° - 60° C., heating the aqueous emulsion at a temperature in the range of 60° - 200° C. at normal atmospheric or superatmospheric pressure to harden the resin thereby preparing a suspension of a dyed finely divided hardened resin, and thereafter separating the hardened resin from the suspension followed by drying and de-aggregating the dried hardened resin.

4,069,177

WATER ABSORBING AND URINE STABLE STEP-WISE GRAFTED STARCH-POLYACRYLONITRILE COPOLYMERS

Theodore Smith, 3305 Mulberry Avenue, Muscatine, Iowa 52761

Filed June 21, 1976, Ser. No. 697,736
Int. Cl.[2] C08L 3/02
U.S. Cl. 260—17.4 GC 18 Claims

1. An alkali metal carboxylate salt of a starch-polyacrylonitrile graft copolymer produced by saponifying a starch polyacrylonitrile graft copolymer, said copolymer being produced by step-wise grafting of starch by acrylonitrile, the mole ratio of said starch to acrylonitrile being at least 1:6.

4,069,178

PROCESS FOR PREPARATION OF WATER-SOLUBLE, SILICONE MODIFIED ALKYD RESINS

Ryuzo Mikami, Ichihara, and Tsuneo Hanada, Chiba, both of Japan, assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 25, 1976, Ser. No. 661,452
Claims priority, application Japan, Mar. 17, 1975, 50-31169
Int. Cl.[2] C09D 3/64, 3/82
U.S. Cl. 260—22 S 5 Claims

1. A process for the preparation of water soluble, silicone-modified alkyd resins which comprises

I. forming an alkyd resin (A) by reacting

1. 0 to 70 percent by weight of a drying oil fatty acid,
2. 18 to 70.9 percent by weight of a dicarboxylic acid or its anhydride or a mixture of them, with
3. 19 to 51.7 percent by weight of an aliphatic polyhydric alcohol wherein the percent by weight of (1), (2) and (3) is based on the total combined weight of (1), (2) and (3), the mole ratio of (2) to (3) being in the range of from 1 to 0.6, until the alkyd resin has an acid number of 20 or less, and then

II. reacting with 28 to 92 parts by weight of (A) 5 to 60 parts by weight of a silicone compound (B) represented by the formula

$$(R_nSiX_mP_{(4-m-n)/2})_y$$

wherein R is a monovalent hydrocarbon radical, X is an alkoxy or hydroxy radical, n is a number of from 1 to 2, m is a number of from 0.05 to 3, the sum of $m+n$ does not exceed 4 and y is a number of at least 3, and

III. reacting 3.0 to 18.5 parts by weight of a polyvalent carboxylic acid (C) with the reaction product of (A) and (B) to introduce carboxylic groups into said reaction product until the acid value thereof is from 25 to 70.

4,069,179

COMPOSITIONS AND METHODS RELATING TO TRANSFER PROCESSES

Frederick L. Jones, Dayton, Ohio, assignor to Monarch Marking Systems, Dayton, Ohio

Division of Ser. No. 456,718, April 1, 1974, Pat. No. 3,946,138.
This application Mar. 10, 1976, Ser. No. 665,742
Int. Cl.[2] B32B 27/30, 27/36; B41M 5/02
U.S. Cl. 260—23 R 11 Claims

1. An oil-in-water emulsion, useful in preparing an image forming transfer element, comprising:

a. a continuous aqueous phase comprising a solubilized partially hydrolyzed polyvinyl acetate polymer, hydrolyzed to the extent of between about 80% and about 95%, having dispersed therein

b. a discontinuous dispersed phase comprising:

i. at least about 40% by weight of a vehicle comprising at least one C_{12} to C_{20} aliphatic alcohol containing an even number of carbon atoms, said vehicle having a freezing point below about 20° C., having dispersed therein

ii. a colorant, which is a dye, a pigment, or a combination thereof, the ratio of polymer to the discontinuous phase (b) being between about 1:1 and 1:3.

4,069,180

HALOGENATED POLYACRYLATE ELASTOMERS

David Calder Chalmers, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed July 30, 1975, Ser. No. 600,449
Claims priority, application Canada, Sept. 26, 1976, 210139
Int. Cl.[2] C08F 28/00; C08L 91/00
U.S. Cl. 260—23 AR 4 Claims

1. A vulcanizable halogenated elastomeric polymer comprising a copolymer of at least one alkyl acrylate or alkyl methacrylate, the alkyl groups having one to four carbon atoms, and at least one diolefinic hydrocarbon selected from isoprene and ethylidene norbornene, said diolefinic hydrocarbon forming from about 0.1 to about 6 mole percent of the copolymer, said copolymer being halogenated by reaction with a halogen selected from bromine and chlorine such that the amount of halogen in said copolymer is from about 0.1 to about 6 weight percent.

4,069,181

ASPHALT COMPOSITIONS

James Churchill Healy, and Roy Francis Whitaker, both of Avon, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed June 28, 1976, Ser. No. 700,445
Int. Cl.[2] C08L 95/00
U.S. Cl. 260—28.5 AS 14 Claims

1. An asphalt composition containing 100 parts by weight of an asphalt and from about 1 to about 30 parts by weight of a bound rubber masterbatch consisting of at least one elastomer selected from the group consisting of ethylene-propylene-diene terpolymer and ethylene-propylene copolymer and at least one carbon black having a dibutyl phthalate absorption value greater than 120 wherein said elastomer is first premixed with said carbon black to form a bound rubber masterbatch, and said masterbatch is then mixed with said asphalt, and the quantity of said carbon black that is first premixed with said elastomer is sufficient to increase the specific gravity of the bound rubber masterbatch to a value within 0.2 gram per cubic centimeter of the specific gravity of the asphalt cement.

4,069,182

ELASTOMERIC PAVEMENT REPAIR COMPOSITION

Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009

Continuation-in-part of Ser. No. 589,190, Oct. 21, 1966, abandoned, and Ser. No. 376,919, July 5, 1973, Pat. No. 3,891,585. This application Feb. 7, 1975, Ser. No. 544,651
The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.
Int. Cl.[2] C08L 95/00
U.S. Cl. 260—28.5 AS 22 Claims

1. An elastomeric material consisting essentially of paving grade asphalt and non-oil resistant asphalt-soluble rubber; the material being prepared by heating paving grade asphalt to a temperature of from about 300° F to about 500° F to yield hot liquid asphalt; mixing between about one part and about five parts by weight of the hot asphalt with about one part by weight particulate non-oil resistant asphalt-soluble rubber to form a jellied composition.

11. A method of sealing joints and cracks in structures which comprises the steps of:

a. preparing a hot elastomeric material consisting essentially of paving grade asphalt and non-oil resistant asphalt-soluble rubber by heating paving grade asphalt to a temperature of from about 300° F to about 500° F to form hot liquid asphalt, and mixing from about one part to about five parts by weight of the hot asphalt with about one part by weight of particulate non-oil resistant asphalt-soluble rubber to form a jellied composition;

b. injecting the hot elastomeric material into the crevice of a joint or crack to seal and fill the same; and
c. allowing the injected elastomeric material to cool.

4,069,183
AQUEOUS STOVING COATING COMPOSITION COMPRISING N-OXIDE STRUCTURES CONTAINING POLYHYDROXY COMPONENTS

Wolfgang Daimer, Graz, Austria, assignor to Vianova Kunstharz, A.G., Vienna, Austria

Filed Dec. 2, 1975, Ser. No. 637,010
Claims priority, application Austria, Dec. 4, 1974, 9708/74
Int. Cl.[2] C08L 61/10
U.S. Cl. 260—29.3 9 Claims

1. Aqueous coating compositions characterized in that the resin binder comprises
a. from about 5 - 90 percent by weight of a water-soluble polyhydroxy component containing at least about 1 mole of amine oxide structure in 1000 g of solids, and
b. from about 5 - 90 percent by weight of a polycarboxy component having an acid value of from about 30 to 280 mg KOH/g, the carboxy groups of which are partially or completely neutralized with a nitrogen base;
components (a) and (b) forming a physical blend or a partial condensation product, the degree of said partial condensation not surpassing the solubility stage of the composition.

4,069,184
WATER DISPERSIBLE, LOW MOLECULAR WEIGHT POLYAMIDE RESIN PARTICLES OF UNIFORM SIZES, METHOD OF PREPARING SAME AND COATINGS FORMED THEREFROM

Charles F. Ferraro, Trenton; Richard A. Javick, Princeton Junction, both of N.J., and James A. Robertson, Levittown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 492,609, July 29, 1974, abandoned, which is a division of Ser. No. 248,063, April 27, 1972, Pat. No. 3,844,991. This application Apr. 30, 1976, Ser. No. 681,852
Int. Cl.[2] C08J 3/00
U.S. Cl. 260—29.2 N 6 Claims

1. As an article of manufacture, free flowing, spray dried low molecular weight, linear polyamide resin powder having a reduced viscosity of between about 0.1 and about 0.4, consisting essentially of loosely bound agglomerates of loosely packed, randomly oriented, clusters of flaky sheets, the flaky sheets having a mean particle size between 0.03 micron and about 6 microns and the particle size distribution is about $d \pm 0.8d$ where d is the means particle size, the agglomerates having a size within a range of between about 3 microns and about 150 microns and being further characterized in that when dispersed in water the agglomerates disintegrate into loosely packed, randomly oriented, clusters to flaky sheets having particle sizes of approximately the same size and size distribution as the original flaky sheets and form a stable dispersion of flaky sheets.

4,069,185
ANTICOAGULANT COATING COMPOSITION

Kevin J. Sullivan, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

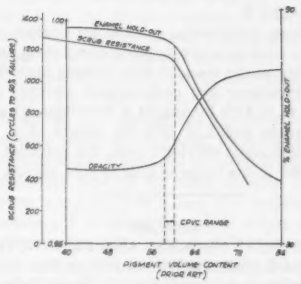
Filed Apr. 22, 1976, Ser. No. 679,166
Int. Cl.[2] C08L 39/06
U.S. Cl. 260—29.6 HN 6 Claims

1. An anticoagulant coating solution comprising a solvent and a filler, said filler consisting essentially of
from about 10 percent to about 95 percent by weight of a salt of ethylene diamine tetracetate, and
from about 5 percent to about 90 percent by weight of polyvinyl pyrrolidone.

4,069,186
OPACIFIED LATEX PAINT CONTAINING PLASTIC POLYMER PARTICLES

Alex Ramig, Brunswick, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 663,064, March 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 473,287, May 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 345,301, March 27, 1973, abandoned. This application Aug. 26, 1976, Ser. No. 718,049
Int. Cl.[2] C08L 25/06, 27/06, 33/12
U.S. Cl. 260—29.6 RB 10 Claims



1. An aqueous latex dispersion paint composition which coalesces at an ambient coalescing temperature into a hardened paint film, said latex paint having about 30% to 70% by weight total solids and comprising on a dry solids volume basis:
25% to 70% of a film-forming latex binder having a major weight portion of polymer particles between about 1,000 A and 10,000 A and having a glass transition temperature at least about 5° C. below said coalescing temperature whereby said binder particles will coalesce into a binding matrix, said latex binder being a polymer or a copolymer derived from ethylenically unsaturated monomers;
10% to 60% of solid, non-cellular, non-film-forming polymer particles having a weighted average diameter between about 1,000 A and 10,000 A and having a glass transition temperature at least about 30° C. above the glass transition temperature of said binder, said non-film-forming particles being polymerized ethylenically unsaturated monomers having carbon-to-carbon unsaturation;
5% to 25% opacifying pigment having a refractive index of at least about 1.8 and being in a volumetric proportion less than the volumetric proportion of said non-film-forming polymer particles;
0% to 60% of non-opacifying pigment; and
said latex paint having a pigment-volume-content (PVC) between about 30% to 75% wherein the PVC is greater than the critical-PVC (opacity) as measured by the lower break in the opacity curve.

4,069,187
COATING COMPOSITIONS AND PROCESSES

Russell C. Miller, Chicago, Ill., assignor to J. M. Eltzroth & Associates, Inc., Schaumburg, Ill.

Continuation of Ser. No. 505,212, Sept. 12, 1974, abandoned. This application Apr. 23, 1976, Ser. No. 679,694
Int. Cl.[2] C08L 33/00
U.S. Cl. 260—29.6 M 3 Claims

1. An emulsion coating composition containing water in the continuous phase and having in the discontinuous phase at least one water insoluble particulate film-forming thermoplastic resin and a water insoluble pigment selected from the group consisting of strontium chromate, calcium silicofluoride and a chromate containing calcium silicofluoride, the weight ratio of said pigment to said resin being within the range of 1:99 to 40:60, the solids content of said composition being within the range of 15–35% by weight, excluding pigmentation, said

composition also containing a substance from the group consisting of ammonium hydroxide, dimethylethanolamine and diethanolamine, the viscosity of said composition being within the range of 25–45 seconds on a Zahn 1 cup and 17–35 seconds on a Zahn 2 cup.

4,069,188

COPOLYMERS OF BUTADIENE AND CARBOXYLATED STYRENE

Pierre Canard, Versailles, and Albert Levy, Orly, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 12, 1976, Ser. No. 666,488

Int. Cl.[2] C08L 9/08

U.S. Cl. 260—29.7 T **3 Claims**

1. An aqueous composition suitable for coating paper and cardboard for photogravure printing comprising an aqueous latex containing as the essential film-forming ingredient a copolymer of butadiene and carboxylated styrene, consisting essentially of 41 to 45% by weight of butadiene, 45 to 57% by weight of styrene and 2 to 10% by weight of at least one unsaturated carboxylic ethylenic acid, the particles of which have a diameter in the range of 0.08 to 0.14 micron.

4,069,189

CHEMICAL PROCESS AND PRODUCTS

Donald Richard Randell, and Wilfred Pickles, both of Stockport, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 586,851, June 13, 1975, abandoned, which is a division of Ser. No. 370,455, June 15, 1973, Pat. No. 3,919,158, which is a continuation-in-part of Ser. No. 74,909, Sept. 23, 1970, abandoned, which is a division of Ser. No. 645,888, June 14, 1967, Pat. No. 3,567,923. This application Mar. 26, 1976, Ser. No. 670,866

Claims priority, application United Kingdom, June 18, 1966, 27316/66

Int. Cl.[2] C08K 5/52

U.S. Cl. 260—30.6 R **3 Claims**

1. A composition consisting essentially of polyvinylchloride and as a plasticizer therefore, a plasticizing amount of a phosphate ester composition consisting essentially of a phosphorylated tertiary butylated phenol/phenol ester mixture wherein the weight ratio of the tertiary butyl moiety to phenol moiety ranges from 0.076 to about 0.187, which ester is prepared by steps comprising:

a. alkylating at a temperature of about 15° C to 250° C in the presence of a Lewis acid or a Bronsted acid as a catalyst, phenol with isobutylene or diisobutylene to obtain a tertiary butylated phenol reaction mixture, and

b. reacting said tertiary butylated phenol reaction mixture with a phosphorylating agent.

4,069,190

HEAT RESISTANT ETHYLENE-PROPYLENE RUBBER AND INSULATED CONDUCTOR I ⁄ODUCT THEREOF

Joseph Edward Vostovich, Bridgeport, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,555

Int. Cl.[2] C08K 3/04, 3/34

U.S. Cl. 260—31.8 M **8 Claims**

1. A curable ethylene-propylene rubber composition having improved resistance to heat and apt electrical and physical properties, consisting essentially of the combination in approximate parts by weight of:

Ethylene-Propylene Rubber	100	
Chlorosulfonated Polyethylene	3–	10
Zinc Oxide	15–	30
Talc	75–	200
Vinyl Silane	1–	3
Carbon Black	10–	30
Antimony Oxide	0–	6
Antioxidant	0.5–	6
Peroxide Curing Agent	2–	8
Curing Coagent	0–	3.

4,069,191

METAL PATCHING COMPOSITION AND METHOD

John F. Post, Riamede Farm, Chester, N.J. 07930

Division of Ser. No. 474,781, May 30, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,435

Int. Cl.[2] C08L 63/02

U.S. Cl. 260—37 EP **7 Claims**

1. A resinous metal patching material formed by the heat curing of two admixed components, the first component including bisphenol A epoxy resin and a diazo dye, the second component being a polyamide resin having an amine number of between 90 and 350, both components also including a heat insensitive mineral product to increase the thixotropic properties of the components.

4,069,192

LIQUID THERMOSETTING RESINS CONTAINING TITANATE SALTS

Salvatore J. Monte, Staten Island, N.Y., and Gerald Sugerman, Allendale, N.J., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Filed Jan. 30, 1976, Ser. No. 653,773

Int. Cl.[2] C08K 9/04

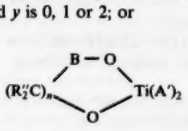
U.S. Cl. 260—37 EP **14 Claims**

1. A filled thermosetting resin composition which comprises a resin containing a comminuted filler and organic titanate compound having the formula:

$$(RO)_z Ti(A)_x(OAr)_y \quad (I)$$

$$ROTi(OAr)_3 \quad (II)$$

where R is a monovalent alkyl, alkenyl, alkynyl or aralkyl group having from 1 to about 30 carbon atoms or a substituted derivative thereof; A is a non-hydrolyzable group having the formula —SAr, $—OSO_2R'$, —OSOR', $(R'O)_2P(O)OP(OH)(O)—$ or $(R'O)_2P(O)O—$, where R' is hydrogen or an alkyl, alkenyl, aryl, aralkyl or alkaryl group having 1 to 30 carbon atoms or a substituted derivative thereof; Ar is a phenyl or naphthyl group having up to 30 carbon atoms or a substituted derivative thereof; the sum of x, y and z is 4; x and z are 1, 2 or 3; and y is 0, 1 or 2; or



(III)

where A' represents a non-hydrolyzable group as defined above for A or an aroxy group, B is an alkylene group (CR_2'') or carbonyl, R'' is hydrogen or alkyl groups having 1 to 6 carbon atoms and n is 1 to 2; said organic titanate compound being present in amounts sufficient to affect the viscosity of the filled liquid thermosetting resin.

4,069,193
MOULDING COMPOSITIONS INCLUDING UNSATURATED POLYESTERS AND AN AMIDE OF AN UNSATURATED ALIPHATIC CARBOXYLIC ACID

Silvio Vargiu, Casatenovo, Como; Piero Paparatto, Milan; Antonio Parodi, Monza, Milan, and Giorgio Brumat, Verano Brianza, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Oct. 20, 1976, Ser. No. 734,347
Claims priority, application Italy, Oct. 30, 1975, 28811/75
Int. Cl.[2] C08G *63/54, 63/68*
U.S. Cl. 260—40 R **16 Claims**

1. A granular molding composition suitable for injection molding comprising:

a. from 10 to 50 wt.% of unsaturated polyester A and/or unsaturated polyester B, wherein:

said unsaturated polyester A is the polycondensation product of 2,2'-bis(4-hydroxycyclohexyl) propane or a halogenated derivative thereof, and an ethylenically unsaturated dicarboxylic acid, having the following characteristics:

melting point (at the capillary) > 70° C
acid value (mg KOH/g) < 50
Gardner viscosity (at 25° C in 60 wt.% solution in styrene) from Y to Z_3;

said unsaturated polyester B is the polycondensation product of an alkylene glycol, an ethylenically unsaturated dicarboxylic acid and a saturated dicarboxylic acid, having the following characteristics:

melting point (at the capillary) ≧ 60° C
acid value (mg KOH/g) < 50
Gardner viscosity (at 25° C in 60 wt.% solution in styrene) from U to Z_2;

b. from 0.5 to 10 wt.% of an amide of an ethylenically unsaturated aliphatic carboxylic acid;

c. from 0.2 to 2 wt.% of an organic peroxide having a decomposition temperature above 70° C; and

d. one or more inert fillers.

4,069,194
PROCESS FOR THE SOLID STATE POLYCONDENSATION OF LINEAR POLYESTERS

Werner Gey, Offenbach (Main); Wolfgang Langhauser, Bergen-Enkheim; Helmut Heinze, Frankfurt am Main; Hans-Joachim Rothe, Bischofsheim, and Peter Freund, Bad Vilbel, all of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Germany

Filed Nov. 7, 1975, Ser. No. 629,806
Claims priority, application Germany, Nov. 12, 1974, 2453577
Int. Cl.[2] C08K *7/20*
U.S. Cl. 260—40 R **4 Claims**

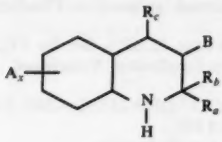
1. Process for solid-state polycondensation of linear polyesters in granulated form comprising moving the granulate in an inert gas stream at temperatures of 30° to 5° C below the melting point of the polymer continuously through a reaction vessel, and preventing agglutination of the granulate by an addition of fine-particle glass as a separating agent, characterized in the prior to entering the reactor there is admixed with the granulate 0.2 to 5% by weight of a glass powder having particles of substantially spherical form with a diameter between about 3 and 30μ.

4,069,195
SUBSTITUTED DECAHYDROQUINOLINES AND THEIR USE AS ULTRAVIOLET LIGHT STABILIZER

Robert Wesley Layer, Cuyahoga Falls, and Pyong-Nae Son, both of Akron, Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed June 18, 1976, Ser. No. 697,387
Int. Cl.[2] C08J *3/20*
U.S. Cl. 260—45.8 NW **11 Claims**

1. Compositions comprising (A) polymeric plastic materials subject to ultraviolet light degradation and (B) from about 0.05 part to about 10 parts by weight per 100 parts by weight of the plastic material of substituted decahydroquinoline compounds and the dimers thereof having the structural formula



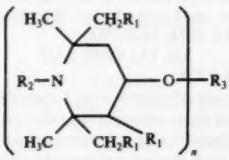
wherein R_a, R_b, and R_c each independently are alkyl groups containing 1 to about 12 carbon atoms, a cyclohexyl group, or cyclohexylalkyl groups containing 7 to about 14 carbon atoms; A is selected from the group consisting of alkyl groups containing 1 to about 24 carbon atoms, hydroxyalkyl groups containing 1 to about 18 carbon atoms, alkoxy groups containing 1 to about 12 carbon atoms in the group, ester groups containing a total of from 2 to about 24 carbon atoms in the group, a cyclohexyl group, cyclohexylalkyl groups containing 7 to about 14 carbon atoms in the group, hydroxy groups, amino groups and aminoalkyl groups and alkyl-substituted amino and aminoalkyl groups wherein the alkyl contains 1 to about 12 carbon atoms; x is 0, 1, 2 or 3; and B is hydrogen, an alkyl group containing 1 to about 12 carbon atoms, a cyclohexyl group, or a cyclohexylalkyl group of 7 to about 14 carbon atoms in the group; and, further, wherein the dimers of the above compounds are essentially two decahydroquinoline compounds of the above structural formula attached to each other at the 4-positions, the 6-positions, the 8-positions, the 4'-, 6'-positions, and the 4'-, 8-positions on the molecule.

4,069,196
PIPERIDYL ESTERS OF HIGHER DI-TRI-, AND POLYBASIC ALIPHATIC CARBOXYLIC ACIDS AS STABILIZERS FOR POLYMERIC MATERIALS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,431
Int. Cl.[2] C07D *11/06;* C08K *5/34*
U.S. Cl. 260—45.8 N **16 Claims**

1. A piperidyl ester having the formula



wherein R_1 is hydrogen or a lower alkyl group of 1 to 5 carbon atoms,

R_2 is hydrogen, oxyl, alkyl having 1–12 carbon atoms, alkoxyalkyl of 2 to 21 carbons, alkenyl of 3 to 6 carbons, alkinyl of 3 to 6 carbons benzyl or benzyl substituted by alkyl groups of 1 to 4 carbons, or acyl derived from a saturated or unsaturated aliphatic acid of 1 to 4 carbons or aliphatic, cycloaliphatic or aromatic carbamic acid of the formula —CO—NH—R or aliphatic, cycloaliphatic or aromatic carbonic acid half ester of the formula —COOR wherein R is alkyl of 1 to 6 carbons,

n is an integer of 2 or 3;

when n = 2, R_3 is a diacyl group derived from a straight or branched chain aliphatic or alicyclic, saturated or unsaturated carboxylic acid, having 36 carbon atoms

when n is 3, R_3 is a tri-acyl group derived from a straight or branched chain aliphatic or alicyclic saturated or unsaturated carboxylic acid having from 37 to 54 carbon atoms.

4,069,197

DIONES AND THEIR USE AS POLYMER STABILIZERS

Siegfried Rosenberger, Riehen, and Andreas Schmidt, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

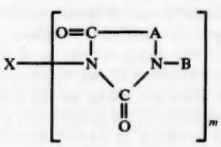
Filed Mar. 31, 1976, Ser. No. 672,566

Claims priority, application Switzerland, Apr. 10, 1975, 4568/75

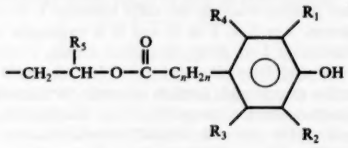
Int. Cl.[2] C07D 233/72; C08K 5/34

U.S. Cl. 260—45.8 NE 9 Claims

1. A compound of the formula



wherein A is alkylidene, B is a group of the formula



wherein R_1 and R_2 are alkyl, R_3, R_4 and R_5 are hydrogen or alkyl and n is 0, 1 or 2 and m is 1 or 2, and X is identical to B if m equals 1 or X is methylene if m equals 2.

7. A composition of matter comprising a synthetic organic polymer and from 0.01 to 5% by weight of a stabilizing compound of claim 1.

4,069,198

POLYESTERS AND POLYESTER-URETHANES STABILIZED WITH ISOUREAS OR ISOCYANATE ADDUCTS THEREOF

Arthur Ibbotson, Manchester, England, assignor to Imperial Chemical Industries Limited, Great Britain

Filed June 20, 1975, Ser. No. 588,946

Claims priority, application United Kingdom, July 29, 1974, 33326/74; Oct. 14, 1974, 44402/74

Int. Cl.[2] C08K 5/21

U.S. Cl. 260—45.9 KB 5 Claims

1. A composition of matter which comprises a compound containing one or more ester groups selected from the group consisting of polyesters and polyesterurethanes and a stabilizing amount of a stabilizer against hydrolysis selected from the group consisting of isourea and isocyanate adducts thereof the amount of said stabilizer being 0.1 to 10 parts by weight per 100 parts of said ester group-containing compound.

4,069,199

METAL SALTS OF HINDERED PIPERIDINE CARBOXYLIC ACIDS AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

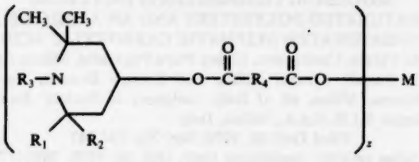
Continuation-in-part of Ser. No. 429,237, Dec. 28, 1973, Pat. No. 3,939,163. This application Sept. 22, 1975, Ser. No. 615,642

The portion of the term of this patent subsequent to June 21, 1994, has been disclaimed.

Int. Cl.[2] C07D 211/46; C08K 5/34

U.S. Cl. 260—45.75 C 25 Claims

1. A compound of the formula



wherein

R_1 and R_2 independently of each other are straight- or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl or alkyl substituted benzyl,

R_4 is straight- or branched-chain alkylene having 1 to 4 carbon atoms,

M is a metal selected from the group consisting of barium, magnesium, calcium, sodium, copper, and potassium, and the value of z is the same as the available valence of M.

12. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.005 to 5% of the stabilizing compound of claim 1.

4,069,200

2,3,5-TRIALKYL-4-HYDROXYBENZYLPHOSPHONATES AND PHOSPHINATES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

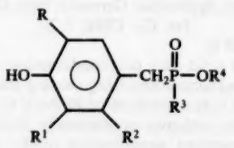
Division of Ser. No. 492,089, July 26, 1974, Pat. No. 3,962,377, which is a continuation-in-part of Ser. No. 400,601, Sept. 25, 1973, abandoned. This application Mar. 19, 1976, Ser. No. 668,357

Int. Cl.[2] C08K 5/36, 5/53

U.S. Cl. 260—45.85 S 7 Claims

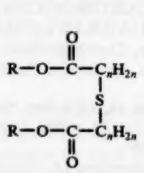
1. A composition of matter comprising a synthetic organic polymer and,

a. from 0.01 to 5% by weight of a stabilizing compound of the formula



wherein R is alkyl of 4 to 8 carbon atoms, R^1 and R^2 are methyl or together are a butylene chain which, together with the phenyl group, forms a tetrahydronaphthyl group, R^3 is alkoxy of 12 to 24 carbon atoms, and R^4 is alkyl of 12 to 24 carbon atoms, and

b. from 0.01 to 2% by weight of a thio co-stabilizer having the formula



wherein R is alkyl of 6 to 24 carbon atoms and n is 1 to 6.

4,069,201

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,164, Dec. 28, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 642,994
Int. Cl.[2] C08K 5/05
U.S. Cl. 260—45.95 R 3 Claims

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of an oxocarbon acid additive, said additive being disodium chloranilate.

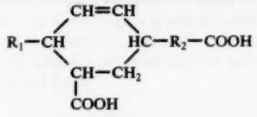
4,069,202

CURABLE POLYEPOXIDE CASTING COMPOSITIONS

James E. Carey, Mantua, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 17, 1975, Ser. No. 623,523
Int. Cl.[2] C08G 59/42
U.S. Cl. 260—47 EC 4 Claims

1. A heat-curable composition comprising (1) 100 parts by weight of a polyepoxide processing more than one 1,2-epoxide group and (2) from 20 to 60 parts by weight of a curing composition comprising (a) 100 parts by weight of a liquid organic dicarboxylic acid of the general formula



wherein R_1 is an alkyl group of up to about 10 carbon atoms and R_2 is an alkylene group of up to 12 carbon atoms and (b) from about 2 to 10 parts by weight of a tertiary amine selected from the group consisting of benzyldimethylamine, tridimethyl amino methyl phenols, and salts thereof.

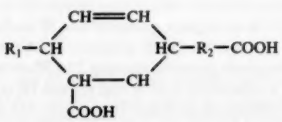
4,069,203

RAPID CURING POLYEPOXIDE COMPOSITIONS

James E. Carey, Mantua, and Lawrence C. Reilly, Cherry Hill, both of N.J., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 17, 1975, Ser. No. 623,522
Int. Cl.[2] C08G 59/58
U.S. Cl. 260—47 EC 7 Claims

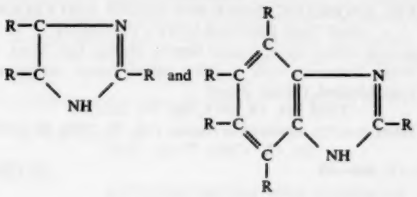
1. A rapid heat-curable composition comprising (1) 100 parts by weight of a polyepoxide having more than 1,2-epoxide group, and (2) from 30 to 70 parts by weight of a composition comprising (a) 100 parts by weight of a liquid organic dicarboxylic acid of the general formula:



wherein

R_1 is an alkyl group of up of about 10 carbon atoms and R_2 is an alkylene group of up to 12 carbon atoms,

and (b) about at least 1.75 parts by weight of an imidazole compound of the general formula:



wherein

R is selected from the group consisting of hydrogen atoms, halogen atoms and hydrocarbon radicals containing no more than 15 carbon atoms.

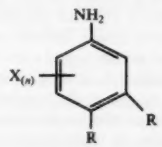
4,069,204

POLYCHLORINATED BENZENE DIAMINES AS CURING AGENTS FOR EPOXY RESINS

Samuel Eugene Susman, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 7, 1976, Ser. No. 693,581
Int. Cl.[2] C08G 59/50
U.S. Cl. 260—47 EN 8 Claims

1. A curable epoxide composition comprising: (a) an epoxide resin containing on average more than one 1,2 epoxide groups per molecule, (b) a curing agent for the epoxide resin of the formula:



wherein one R is an amino group and the other is chlorine; X is chlorine and *n* is an integer of from 1 to 3, said curing agent being present in an amount between about 1 to 100 parts by weight per 100 parts by weight of said epoxide resin.

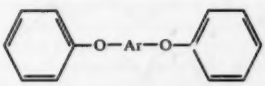
4,069,205

CYCLIC TRI(PHENYLENE DISULFIDE) POLYMERS AND THE PRODUCTION THEREOF

Carl S. Marvel, and Daniel Ting-Man Wong, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 636,801, Dec. 1, 1975, abandoned. This application Sept. 9, 1976, Ser. No. 721,899
Int. Cl.[2] C08G 75/23, 83/00
U.S. Cl. 260—49 22 Claims

1. A polymer comprising cyclic tri(phenylenedisulfide) moieties, wherein the sulfur atoms comprising the disulfide linkages are bonded together as —S—S—, and moieties of a polyaryl ether linked together with bivalent radicals selected from the group consisting of isophthaloyl and terephthaloyl radicals, said polyaryl ether being diphenyl ether or an ether of the formula



wherein Ar is bivalent aromatic radical.

4,069,206

NOVEL AROMATIC IMINE POLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Shigeyoshi Hara, Hino; Masao Senoo, Ehime; Koh Mori, and Yutaka Taketani, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

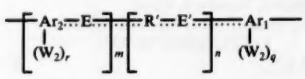
Filed Feb. 18, 1975, Ser. No. 550,738
Claims priority, application Japan, Feb. 20, 1974, 49-19373
Int. Cl.[2] C08G 73/02, 75/23
U.S. Cl. 260—49 32 Claims

1. An aromatic imine polymer comprising

A. 100 to 20 mol%, based on its entire recurring units, of a recurring unit of the formula (I)

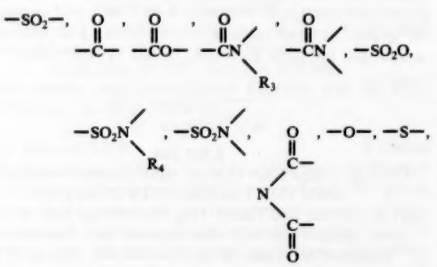
(I)

wherein Z is $-SO_2-$ or $-CO-$; p is 0 or 1; and when p is 0, $-Ar-$ is directly bonded to $-Y_2-$; R is an organic group of 2 to 50 carbon atoms; Ar is a divalent aromatic group not containing a primary or secondary amino group, a hydroxyl group, or a group substantially reactive with said amino and hydroxyl groups and is expressed by the following formula (II)



(II)

wherein Ar_1 is an aromatic ring group containing 6 to 20 carbon atoms and having a valence of $(q + 2)$ or $(q + 3)$; Ar_2 is an aromatic ring group containing 6 to 20 carbon atoms and having a valence of $(r + 2)$ or $(r + 3)$; W_1 and W_2 are identical or different electron-attracting groups selected from nitro, cyano, sulfonic acid ester, carboxamide, and carboxyl groups; q and r are identical or different and each represent 1, 2, 3, or 4; m and n are 0 or 1, and when m is 0, n is also 0; the symbol . . . represents the presence or absence of a bond; E and E′ are identical or different non-aromatic bridging groups selected from the group consisting of



and alkylene groups containing 1 to 6 carbon atoms, R_3 and R_4 being identical or different and representing a hydrogen atom or an alkyl group containing 1 to 3 carbon atoms; and R′ is a member selected from the group consisting of

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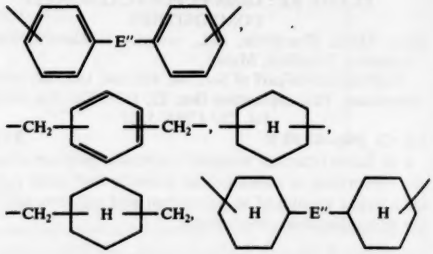
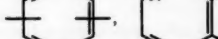


or an alkylene group containing 2 to 15 carbon atoms, wherein E″ is a non-aromatic bridging group selected from one of the members of the group defining E and E′, and the groups R and R′ may have an inert substituent; Y_1 and $(Z)_pY_2$ are bonded respectively to the nuclear carbon atoms of the aromatic ring, and when p is 0, Ar has an electron-attracting group capable of causing the nuclear carbon atoms to which Y_1 and Y_2 are bonded to have a Hammet σ constant of substantially at least $+1$, and when p is 1, Ar has an electron-attracting group capable of causing the nuclear carbon atom to which Y_1 is bonded to have a Hammet σ constant of substantially at least $+1$; said electron-attracting group being at least one member selected from the group consisting of nitro, cyano, sulfone, sulfonic acid ester, sulfonamide, sulfonic acid, carboxylic acid ester, carboxamide, ketone and aldehyde; and Y_1 represents the group

and Y_2 represents the group

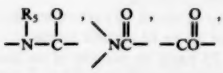
or —O—, in which R_1 and R_2 are identical or different and represent a hydrogen atom or a monovalent or divalent aliphatic hydrocarbon residual group containing 1 to 3 carbon atoms, and when one or both R_1 and R_2 are divalent aliphatic hydrocarbon residual groups containing 1 to 3 carbon atoms, R_1 and/or R_2 can be bonded to R or bonded directly to each other; and when both R_1 and R_2 are a hydrogen atom or a monovalent aliphatic hydrocarbon group, R is a divalent organic group; when one of R_1 and R_2 is a divalent atom or monovalent hydrocarbon group, R is a trivalent organic group; when both of R_1 and R_2 are a divalent hydrocarbon group, R is a divalent or tetravalent organic group; and

B. the remainder (0 to 80 mol%) of the recurring units being a unit expressed by the following formula



(IV)

wherein R″ is an organic group of 2 to 50 carbon atoms; the symbol . . . represents the presence or absence of a bond; D is an organic group containing 2 to 30 carbon atoms and having a valence of 2 to 4; and Q_1 and Q_2 are identical or different bridging groups selected from the group consisting of



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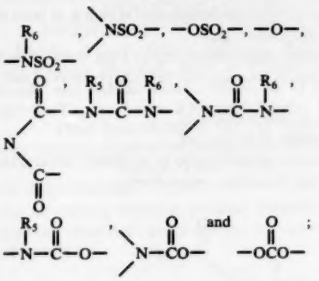


R_5 and R_6 being identical or different and representing a hydrogen atom or a monovalent or divalent hydrocarbon group having 1 to 3 carbon atoms.

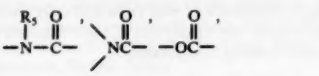
4. A process for preparing a linear aromatic imine polymer containing from 20 to 100 mol% of a recurring unit of the formula

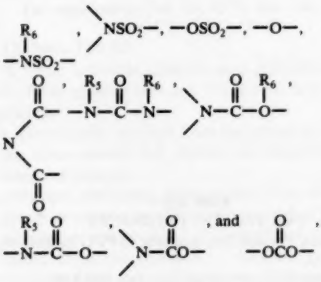
(I)

wherein R, Y_1, Ar, Z, p and Y_2 are defined below, and the remainder (0 to 80 mol%) of the recurring units being a unit expressed by the following formula

(IV)

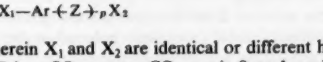
wherein R'' is an organic group; the symbol . . . represents the presence or absence of a bond; D is an organic group containing 2 to 30 carbon atoms and having a valence of 2 to 4; and Q_1 and Q_2 are identical or different bridging groups selected from





R_5 and R_6 being identical or different and representing a hydrogen atom or a monovalent or divalent hydrocarbon having 1 to 3 carbon atoms

which comprises reacting at a temperature of −10° C to 200° C an aromatic dihalogen compound of the formula



wherein X_1 and X_2 are identical or different halogen atoms; Z is $-SO_2-$ or $-CO-$; p is 0 or 1, and when p is 0, —Ar— is directly bonded to X_2; Ar is a divalent aromatic group not containing a primary or secondary amino group, a hydroxyl group or a group substantially reactive with said amino and hydroxyl groups; X_1 and $(Z)_pX_2$ are bonded to the nuclear carbon atoms of the aromatic ring Ar, and when p is 0, Ar has an electron-attracting group capable of causing the nuclear carbon atoms to which X_1 and X_2 are attached to have a Hammet σ constant of substantially at least +1, and when p is 1, Ar has an electron-attracting group capable of causing the nuclear carbon atom to which X_1 is bonded to have a Hammet σ constant of substantially at least +1;

with a difunctional amino-containing compound of the formula

(VI)

wherein

or —O—; R_1 and R_2 are identical or different and represent a hydrogen atom or a monovalent or divalent aliphatic hydrocarbon residual group having 1 to 3 carbon atoms, and when one or both of R_1 and R_2 are divalent aliphatic hydrocarbon residual groups, R_1 and/or R_2 can be bonded to group R or directly to each other; when Y_2 is —O—, it is bonded to the nuclear carbon atom of the aromatic ring of R and therefore, —OH is a phenolic hydroxyl group; and R is an organic group capable of having a valence of 2, 3, or 4 according to the definition of R_1 and R_2 above, when both of R_1 and R_2 are a hydrogen atom or a monovalent aliphatic hydrocarbon group, R is a divalent organic group; when one of R_1 and R_2 is a divalent hydrocarbon group and the other is a hydrogen atom or monovalent hydrocarbon group, R is a trivalent organic group; when both of R_1 and R_2 are a divalent hydrocarbon group, R is a divalent or tetravalent organic group;

in an inert organic solvent in the presence of an acid acceptor.

4,069,207

BROMINATED ESTER-CONTAINING POLYOLS

Howard Paul Klein, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 472,999, May 24, 1974, Pat. No. 3,988,302. This application Feb. 2, 1976, Ser. No. 654,270

Int. Cl.[2] C08G 63/68

U.S. Cl. 260—75 H **11 Claims**

1. A brominated ester-containing polyether polyol prepared by reaction of an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, epichlorohydrin and mixtures thereof and a half-ester in a ratio of said oxide to said half-ester such that said oxide is present in an amount sufficient to reduce the acid number of said brominated ester-containing polyether polyol to 10 ml KOH/g or less and, wherein said half-ester is formed by the reaction of

a. a polyether polyol prepared by the addition of an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and mixtures thereof to a polyhydric compound selected from the group consisting of ethylene glycol, propylene glycol, the isomeric n-butylene glycols, 1,5-pentanediol, 1,6-hexanediol, glycerol, trimethylolpropane, 1,2,6-hexanetriol, sorbitol, sucrose, alpha-methyl glycoside, pentaerythritol, phosphorus acids and phosphorus acid esters having at least one reactive OH, and

b. 4,5-dibromohexahydrophthalic anhydride or its corresponding acid, wherein the mole ratio of polyether polyol (a) to 4,5-dibromohexahydrophthalic anhydride or its corresponding acid (b) is from 2:3 to about 3:1.

2. The brominated ester-containing polyether polyol of claim 1 wherein the mole ratio of polyether (a) to 4,5-dibromohexahydrophthalic anhydride is about 1:1.

4. The brominated ester-containing polyether polyol of claim 2 wherein the polyether polyol is prepared by the addition of a mixture of propylene oxide and ethylene oxide to trimethylolpropane, said polyether polyol having a molecular weight of from about 500 to about 10,000.

4,069,208
HEAT-ACTIVATABLE POLYURETHANE POWDER COATINGS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 14, 1975, Ser. No. 622,431
Int. Cl.[2] C08G *18/12*; C08L *75/00*; C08J *3/12*
U.S. Cl. 260—75 NH **25 Claims**

1. In a process for forming a heat-activatable polyurethane powder characterized by low-melt viscosity upon initial melting, and in which powder the particles are generally bead-like in form, the improvement consisting essentially of (1) reacting

a. one mole of polymeric glycol having a number average molecular weight of about 400–4,000,

b. X moles of a diol having a molecular weight less than about 250 wherein X = 0—20,

c. Y moles of an organic diisocyanate wherein Y = 1.03 (1 + X) to 1.60 (1 + X), d. Z moles of a monohydroxy-epoxide wherein Z = 0.0286 (1 + X) to 1.000 (1 + X),

e. 0.7 (2Y-2-X-Z-2) to 1.0 (2Y-2X-Z-2) moles of a short chain diamine, and (2) selecting the amounts of reactants (d) and (e) so that the polyurethane powder formed will contain 0.2 to 1.1 amino groups per epoxy group, and wherein (3) the size and shape of bead particles is achieved by initially emulsifying reactants (a) and (b) in an inert organic solvent with the aid of a surfactant, followed by converting said emulsion to a dispersion of finely-divided polyurethane beads and recovering the latter.

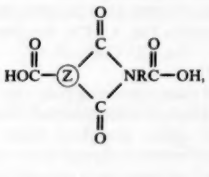
4,069,209
IMINO ACIDS AND RESINS DERIVED THEREFROM

Daniel J. Lange, St. Louis, Mo., assignor to The P. D. George Company, St. Louis, Mo.

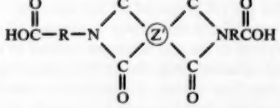
Filed Apr. 12, 1976, Ser. No. 676,550
Int. Cl.[2] C08G *63/68, 69/44*
U.S. Cl. 260—75 N **15 Claims**

1. A resin which is a polyester of

A. a dicarboxylic acid component which is a preformed iminodicarboxylic acid of the formula



or



where Ⓩ and Ⓩ′ are aromatic moieties, the indicated

group attached to Ⓩ being attached to an aromatic ring of Ⓩ the

groups linking an N to Z or Z′ each being attached to an aromatic ring in Ⓩ or Ⓩ′ and being present in a 5 membered imide ring and the moiety R being divalent aliphatic, the N and COOH moieties attached to R being attached to carbons of R, and of a polyhydric alcohol component which is at least one of

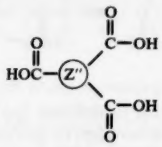
B. a glycol component, and

C. a polyol component containing at least three esterifiable hydroxyl groups, and any further components of said resin being

D. the imide or imide-amide of

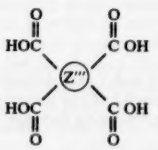
D_1. an aromatic diamine and

D_2. an aromatic tricarboxylic or aromatic tetracarboxylic acid, of the formulae, respectively,



(a)

, and



(b)

two of the COOH groups of the acid (a) and each of the COOH groups of each of the two pairs of such groups of the acid (b) being attached to adjacent carbons of a benzene ring of the Ⓩ″ and Ⓩ‴ moieties, respectively, Ⓩ′ and Ⓩ‴ being aromatic moieties,

where (A) and at least one of (B) and (C) and (D) are the sole polymer forming components of said resin and only the components (A) and at least one of (B) and (C) are required to be present as polymer forming components.

4,069,210
POLYMERIC PRODUCTS

Karl F. Schimmel, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 30, 1976, Ser. No. 728,368
Int. Cl.[2] C08G *73/02*; C08L *79/02*
U.S. Cl. 260—29.2 EP **6 Claims**

1. An internally ionized, quaternary ammonium salt group-containing polymer, comprising the reaction product of:

A. an organic polyepoxide,

B. a polyamine containing at least two tertiary amine groups, formed from reacting:

1. a member selected from the class consisting of an organic polyisocyanate, an organic polycarboxylic acid, ester or anhydride, and mixtures thereof,

2. an active hydrogen-containing tertiary amine in which the active hydrogen is selected from the class consisting of hydroxyl, mercapto, primary and secondary amino;

said reaction product being acidified so as to provide a quaternary ammonium salt group-containing polymer in which the salt groups are located along the polymer backbone.

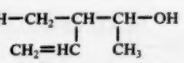
4,069,211

AIR DRYING REACTION PRODUCT OF A DIISOCYANATE AND 1-METHYL-2-VINYL-4,6-HEPTADIENOL

Sadao Nishita, Tokyo; Satoru Enomoto, Fujisawa; Hisayuki Wada; Yutaka Mukaida, both of Tokyo; Mikiro Yanaka, Matsudo, and Hitoshi Takita, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 28, 1976, Ser. No. 700,475
Claims priority, application Japan, June 30, 1975, 50-79978
Int. Cl.[2] C08G 18/04
U.S. Cl. 260—77.5 MA 7 Claims

1. An air drying reaction product formed by admixing a diisocyanate compound and 1-methyl-2-vinyl-4, 6-heptadienol of the formula



and aging the resultant reaction product in a dry nitrogen atmosphere.

4,069,212

FLAME RETARDANT SPANDEX TYPE POLYURETHANES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; John T. Howarth, Reading, Mass.; Suresh Sheth, Somerville, Mass.; Kenneth R. Sidman, Wayland, Mass., and Arthur A. Massucco, Natick, Mass.

Division of Ser. No. 374,421, June 28, 1973, Pat. No. 3,956,233. This application Feb. 13, 1976, Ser. No. 657,907
Int. Cl.[2] C08G 18/10
U.S. Cl. 260—77.5 SP 4 Claims

1. A flame retardant spandex type polyurethane resin suitable for forming into fibers and which is formed from a mixture comprising:

a. a diisocyanate selected from the group consisting of arylene diisocyanates, 4,4' diphenylmethane diisocyanate and mixtures thereof,

b. a halogen containing difunctional polyol selected from the group consisting of dibromoneopentyl glycol, polyesters of dibromoneopentyl glycol, esters of the product obtained from the reaction of ethylene oxide and tetrabromophthalic anhydride, esters of the product obtained from the reaction of propylene oxide and tetrabromophthalic anhydride and esters of the product obtained from the reaction of ethylene oxide, propylene oxide and tetrabromophthalic anhydride, said polyol being substantially free of corresponding monofunctional and trifunctional impurities, and

c. a urea producing compound selected from the class consisting of diamines and water,

wherein the composition defined in (b) is first reacted with a stoichiometric excess of the composition defined in (a) to form an isocyanate terminated prepolymer, said halogen containing polyol being present in an amount sufficient to render said prepolymer substantially non-flammable in ambient environments and wherein said prepolymer is then extended by reacting said prepolymer with the composition defined in (c).

4,069,213

CURABLE COMPOSITION

Masao Onizawa, Kunitachi, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Division of Ser. No. 653,123, Jan. 28, 1976, Pat. No. 4,018,749. This application Oct. 19, 1976, Ser. No. 733,937
Claims priority, application Japan, Jan. 29, 1975, 75-11407; Dec. 11, 1975, 75-146889
Int. Cl.[2] C08F 8/08, 8/00, 8/26
U.S. Cl. 260—78 A 5 Claims

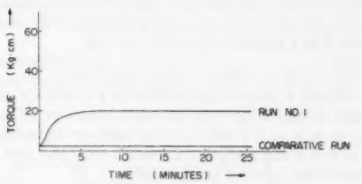
1. A curable composition comprising a liquid polybutadiene having bromine bonded to at least one of its ends, a flowable epoxy resin, and at least one amino acid selected from the group consisting of arginine, lysine, hydroxylysine and ornithine, the amount of the epoxy resin being 1 to 2,500 parts by weight per 100 parts by weight of the polybutadiene rubber, and the amount of the amino acid being 0.1 to 60 parts by weight per 100 parts by weight of the polybutadiene rubber and the epoxy resin combined.

4,069,214

NOVEL CURABLE COMPOSITION

Masao Onizawa, Ohmiya, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1977, Ser. No. 786,673
Claims priority, application Japan, Apr. 16, 1976, 51-42332
Int. Cl.[2] C08F 8/00, 8/32
U.S. Cl. 260—78 A 3 Claims



1. A curable composition consisting essentially of

a. an acrylic copolymer consisting of (1) a major proportion of at least one monomer selected from the group consisting of acrylic esters and methacrylic esters and (2) a minor proportion of another monomer copolymerizable therewith, and

b. at least one curing agent selected from the group consisting of lysine, ornithine, arginine, glutamine, asparagine, citrulline, cystine, hydroxylysine, and salts of these amino acids.

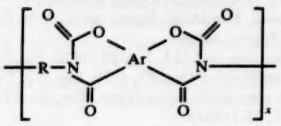
4,069,215

SEMIPERMEABLE MEMBRANES OF SULPHONATED POLYBENZ-1,3-OXAZIN-2,4-DIONES

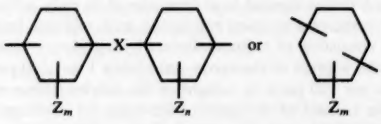
Klaus Elfert; Jürgen Hinz, and Rudolf Binsack, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 10, 1976, Ser. No. 713,142
Claims priority, application Germany, Aug. 16, 1975, 2536492
Int. Cl.[2] B01D 39/00; C08J 5/18; C08L 79/04
U.S. Cl. 260—79.3 R 3 Claims

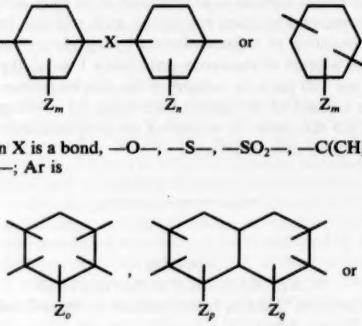
1. A semipermeable membrane of a sulphonated polybenze-1,3-oxazin-2,4-dione, said dione havirg a relative viscosity of from 0.7 to 3.5 measured as a 0.5% by weight solution of dimethyl formamide at 25° C, an acid number of from 1 to 800 and a structure of the formula



wherein R is



wherein X is a bond, —O—, —S—, $—SO_2—$, $—C(CH_3)_2—$ or $—CH_2—$; Ar is



wherein Y is a bond,

—O—, —S—, $—CH_2—$, $—SO_2—$, or —CO—;

Z is $—SO_3H$, a monovalent radical of a sulphonic acid salt of an alkali metal, of an alkaline earth metal or of an organic amine; *m, n, o, p, q, r* and *s* are the same or different; *m* and *n* are 0 to 4; *o, p* and *q* are 0 to 2; *r* and *s* are 0 to 3 and their sum is greater than 1, and *x* is 10 to 200.

4,069,216

SIMPLIFIED METHODS FOR PREPARATION OF VERY HIGH PURITY FACTOR VIII CONCENTRATE

Edward Shanbrom, Santa Ana, Calif., assignor to Edward Shanbrom, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 586,948, June 16, 1975. This application Jan. 30, 1976, Ser. No. 653,973

Int. Cl.² A23J *1/06*

U.S. Cl. 260—112 B **8 Claims**

1. In a process for preparing Factor VIII concentrate, the improvement comprising the step of holding a buffer solution containing Factor VIII and about 6% polyol at a temperature of from about 0° to about 5° C until precipitation occurs.

4,069,217

SOLUBILIZED LIGNOSULFONATE DERIVATIVES

William John Detroit, Schofield, and Michael Elliot Sanford, Wausau, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Mar. 29, 1976, Ser. No. 671,397

Int. Cl.² C07G *1/00*

U.S. Cl. 260—124 R **28 Claims**

1. A composition comprising:

a lignosulfonate or an alkali metal salt derivative thereof derived from sulfite waste liquor that has been subjected to alkaline oxidation, hydrolysis and partial desulfonation with subsequent resulfonation;

said lignosulfonate prior to resulfonation being characterized by a relative molecular size of substantially within the range of 1,000 to 20.,000 and containing combined organic sulfonic sulfur after partial desulfonation of from about 0.5 weight percent to about 5.0 weight percent and from about 1.5 percent to 15 percent by weight of said total combined sulfur upon completion of said resulfonation.

4,069,218

WATER-SOLUBLE FIBER-REACTIVE DISAZO DYESTUFFS

Gert Hegar, Schonenbuch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

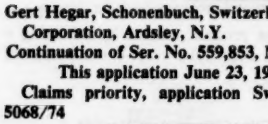
Continuation of Ser. No. 559,853, March 19, 1975, abandoned. This application June 23, 1976, Ser. No. 699,120

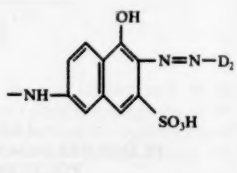
Claims priority, application Switzerland, Apr. 10, 1974, 5068/74

Int. Cl.² C09B *33/12, 33/14, 33/16*

U.S. Cl. 260—153 **2 Claims**

1. An azo dye of the formula





wherein

D_1 and D_2 are monosulfophenyl or disulfophenyl which are substituted by 4-chloro-6-(monosulfophenylamino, disulfophenylamino or sulfo, carboxyphenylamino)-1,3,5-triazin-(2)-ylamino; and

Y is —CO—.

4,069,219

7ξ-(ALKOXYCARBONYL)-6ξ-ALKYL/HALO-17-HYDROXY-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONES AND CORRESPONDING 21-CARBOXYLIC ACIDS, THEIR SALTS, AND ESTERS

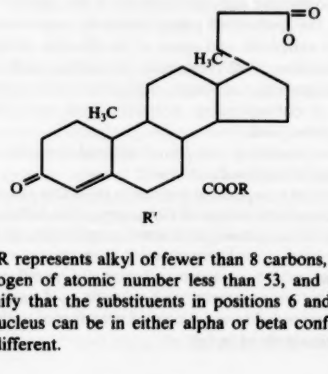
Richard M. Weier, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,136

Int. Cl.² C07J *19/00*

U.S. Cl. 260—239.57 **5 Claims**

1. A compound having the formula



wherein R represents alkyl of fewer than 8 carbons, R′ represents halogen of atomic number less than 53, and the wavy lines signify that the substituents in positions 6 and 7 of the steroid nucleus can be in either alpha or beta configuration, alike or different.

4,069,220

PROCESS FOR THE PRODUCTION OF PHENOLIC COMPLEXES OF HEXAMETHYLENETETRAMINE

Henry Philip Orem, Birmingham; David R. Hart, Auburn, and Jerry E. Hill, Springville, all of Ala., assignors to Jim Walter Resources, Inc., Birmingham, Ala.

Continuation-in-part of Ser. No. 500,906, Aug. 27, 1974, abandoned. This application Sept. 21, 1976, Ser. No. 725,240
Int. Cl.[2] C07D *295/02, 295/08*
U.S. Cl. 544—186 6 Claims

1. A method for preparing a complex of a phenolic compound selected from the group consisting of phenol, resorcinol, dihydroydiphenyl sulfone, B-naphthol, p-cresol, p-phenylphenol, m-methoxyphenol, 3,5-xylenol, o-cresol, o-chlorophenol, o-phenylphenol and 2,4-dichlorophenol comprising: mixing the phenolic compound and hexamethylenetetramine and a suitable solvent in which mixture the amount of solvent is insufficient to dissolve all of the hexamethylenetetramine and all of the phenolic compound simultaneously, and drying the mixture at a temperature less than that which would cause decomposition of the complex.

4,069,221

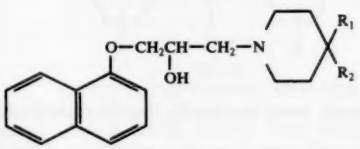
1-(1-NAPHTHOXY)-3-(4-SUBSTITUTED-PIPERIDINO)-2-PROPANOLS

Peter K. Yonan, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 585,355, June 9, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,317
Int. Cl.[2] C07D *211/62, 211/64*
U.S. Cl. 260—293.62 4 Claims

1. A compound of the general formula

(I)



wherein R_1 is cyano, or lower alkoxycarbonyl, and R_2 is phenyl, p-chlorophenyl, and, optionally, when R_1 is cyano, R_2 may be hydrogen.

4,069,222

PROCESS FOR PREPARING 2-(2,2-DICYCLOHEXYLETHYL)PIPERIDINE

Stephen W. Horgan; Frank P. Palopoli, both of Montgomery, Ohio, and Edward J. Schwoegler, Munster, Ind., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 14, 1976, Ser. No. 677,069
Int. Cl.[2] C07D *211/10*
U.S. Cl. 260—293.52 5 Claims

1. A process for the preparation of 2-(2,2-dicyclohexylethyl)piperidine which comprises azeotropically distilling a mixture of finely-divided, porous Raney catalyst in a solvent selected from the group consisting of cyclohexane, pentane hexane, heptane, dioxane or tetrahydrofuran so as to remove all traces of moisture; adding a mixture of 2-(2,2-diphenylethenyl)pyridine in said solvent to said catalyst mixture; reducing said 2-(2,2-diphenylethenyl)pyridine in the presence of hydrogen at a pressure of from 70 to 140 atmospheres and at a temperature of from 160° to 250° C. and recovering the 2-(2,2-dicyclohexylethyl)piperidine obtained therefrom.

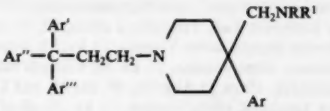
4,069,223

4-AMINOMETHYL-1-(3,3,3-TRIARYLPROPYL)-4-ARYL-PIPERIDINE AND DERIVATIVES THEREOF

Gilbert W. Adelstein, Evanston, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed May 2, 1977, Ser. No. 792,616
Int. Cl.[2] C07D *401/06, 211/26*
U.S. Cl. 260—293.76 7 Claims

1. A compound of the formula



and the non-toxic pharmacologically acceptable acid addition salts thereof; wherein Ar, Ar′ and Ar″ are each phenyl, halophenyl or alkylphenyl wherein alkyl contains from 1 to 4 carbon atoms; Ar‴ is phenyl, halophenyl, alkylphenyl wherein alkyl contains from 1 to 4 carbon atoms or pyridyl; R is hydrogen, alkyl having from from 1 to 6 carbon atoms or alkanoyl having from 2 to 6 carbon atoms; and R^1 is hydrogen or alkyl having from 1 to 6 carbon atoms.

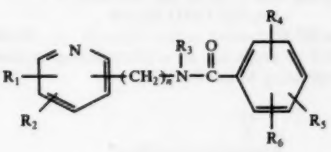
4,069,224

NOVEL BENZAMIDES

William A. Callahan, Richland Township, Kalamazoo County; Eldridge Myles Glenn, Kalamazoo, and Douglas L. Rector, Parchment, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 428,364, Dec. 26, 1973, abandoned. This application June 25, 1975, Ser. No. 590,032
Int. Cl.[2] C07D *213/81*
U.S. Cl. 260—295 AM 29 Claims

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 and R_2 are each hydrogen, halogen, hydrocarbyl of one to six carbon atoms, inclusive alkoxy of 1 to 12 carbon atoms, inclusive, nitro, amino, alkylamino of 1 to 12 carbon atoms, inclusive, dialkylamino, each alkyl of 1 to 12 carbon atoms, inclusive, acylamino with alkyl of 1 to 12 carbon atoms, inclusive, or trihalomethyl; R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, inclusive, cycloalkyl of 3 to 8 carbon atoms, inclusive, aryl of 6 to 12 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, or aryl of 6 to 12 carbon atoms, inclusive, substituted with halogen, alkoxy of 1 to 4 carbon atoms, inclusive, halogen-substituted alkyl of 1 to 4 carbon atoms, inclusive, or halogen-substituted alkoxy of 1 to 4 carbon atoms, inclusive, R_4 is hydrogen, bromine, fluorine, iodine, hydrocarbyl of 1 to 12 carbon atoms, inclusive, or halogen-substituted hydrocarbyl of 1 to 12 carbon atoms, inclusive; R_5 is nitro, amino, acylamino with alkyl of 1 to 12 carbon atoms, inclusive, alkylamino with alkyl of 1 to 12 carbon atoms, inclusive, dialkylamino with each alkyl of 1 to 12 carbon atoms, inclusive, aryloxy of 6 to 12 carbon atoms, inclusive, or a group R_4 as previously defined; R_6 is chlorine, or a group R_5 as defined above; n is an integer of from 1 to 2; provided that when R_4, R_5 and R_6 are each hydrogen or when R_4 and R_5 are hydrogen and R_6 is alkyl of one to twelve carbon atoms, inclusive, amino or nitro, then at least one of R_1 and R_2 is halogen, phenyl, alkoxy of 1 to 12 carbon atoms, inclusive, alkylamino with alkyl of 1 to 12 carbon atoms, inclusive, dialkylamino

with each alkyl of 1 to 12 carbon atoms, inclusive, acylamino with alkyl of one to 12 carbon atoms, inclusive, or trihalomethyl.

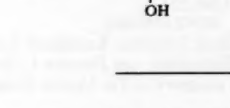
4,069,225

3-(1-HYDROXYETHYL)IMINO-1,2,4-DITHIAZOLIDINE-5-THIONE

Vasily Efimovich Privalov, ulitsa Kostomarovskaya, 5/7, kv. 15; Evgeny Iosifovich Vail, Tobolskaya ulitsa, 52, kv. 36; Andrei Mefodievich Khanin, ulitsa Vesnina, 12, kv. 52; Evgeny Ivanovich Gromov, ulitsa Vesnina, 12, kv. 32; Viktoria Mikhailovna Petropolskaya, ulitsa 23 Avgusta, 29, kv. 45, and Lidia Mikhailovna Agarkova, ulitsa Vesnina, 12, kv. 11, all of Kharkov, U.S.S.R.

Filed May 11, 1972, Ser. No. 252,455
Int. Cl.[2] C07D *285/00*
U.S. Cl. 260—306.8 R **1 Claim**

1. A compound of the formula



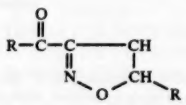
4,069,226

PREPARATION OF ACYLISOXAZOLINES

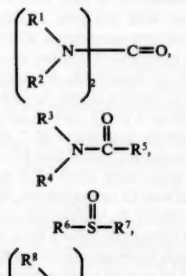
Mahmoud S. Kablaoui, Wappingers Falls, N.Y.; John M. Larkin, Austin, and Robert E. Reid, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,377
Int. Cl.[2] C07D *261/04*
U.S. Cl. 260—307 F **8 Claims**

1. A method of preparing an acylisoxazoline or mixtures thereof corresponding to the formula:



where R is an alkyl group having from 2 to 20 carbon atoms which comprises contacting a 1-alkene, or mixtures thereof, of the formula $R—CH=CH_2$ with dinitrogen tetroxide and oxygen in the presence of a denitrating agent that consists of one or more compounds selected from



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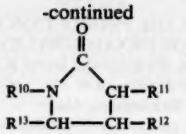


where R^1, R^2, R^6, R^7, R^8, R^9 and R^{10} are alkyl of from 1 to 5 carbons and R^3, R^4, R^5, R^{11}, R^{12}, and R^{13} are hydrogen or alkyl of from 1 to 5 carbons and calcium oxide at a temperature of about −10° to 40° C., wherein the mole ratio of alkene to dinitrogen tetroxide to oxygen is from about 1:0.02:0.04 to 1:0.4:30 and the mole ratio of dinitrogen tetroxide to denitrating agent to calcium oxide is from about 1:0.5:0.5 to 1:5:5.

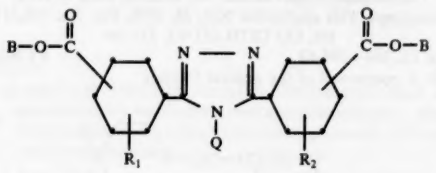
4,069,227

BIS-HETEROCYCLIC BENZOATE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 484,843, July 1, 1974, Pat. No. 3,963,738. This application Feb. 12, 1976, Ser. No. 657,510
Int. Cl.[2] C07D *249/08*
U.S. Cl. 260—308 R **2 Claims**

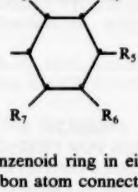
1. A composition of matter having the formula:



wherein

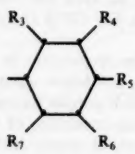
Q is hydrogen, lower alkyl having 1 to 12 carbon atoms, or benzyl;

R_1 and R_2 are hydrogen, chloro, or bromo; and



is attached to the benzenoid ring in either the meta or para position from the carbon atom connected to the heterocyclic ring; and

B is a group having the formula



wherein

at least one R_3 is hydrogen and the other R_3, R_4, R_5, R_6 and R_7 of each B group are hydrogen, or at the most two substituents selected from lower alkyl, hydroxy, chloro and bromo.

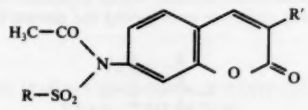
4,069,228

COUMARINS CONTAINING SULPHONYLAMINO GROUPS

Carl Wolfgang Schellhammer, and Florin Seng, both of Schildgen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 23, 1976, Ser. No. 698,925
Claims priority, application Germany, June 27, 1975, 2528698
Int. Cl.[2] C07D *405/04, 407/04*
U.S. Cl. 260—308 R 7 Claims

1. A coumarin of the formula



wherein

R is C_1–C_4-alkyl unsubstituted or substituted with halogen; or phenyl unsubstituted or substituted with halogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy; and

R′ is an aromatic heterocyclic radical selected from the group consisting of benzofuran-2-yl, 1,2,4-triazol-1-yl, pyrazol-1-yl, 4-chloropyrazol-1-yl and benzotriazol-2-yl, each of which is unsubstituted or subtituted with C_1–C_4-alkyl or halogen.

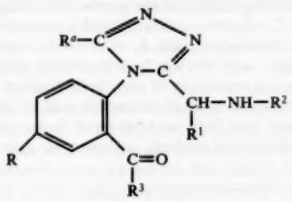
4,069,229

SUBSTITUTED PHENYL KETONES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Huntingdon, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 605,580, Aug. 18, 1975, Pat. No. 4,007,219.
This application Nov. 11, 1976, Ser. No. 740,701
Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21821/75; Aug. 11, 1975, 36567/75
Int. Cl.[2] C07D *249/08*
U.S. Cl. 260—308 R 2 Claims

1. A compound of the general formula



wherein R is selected from the group consisting of a halogen atom, nitro and a trifluoromethyl group; R^1 is a hydrogen atom or a lower alkyl group; R^2 is an acyl group derived from a naturally occurring amino acid; R^3 is selected from the group consisting of phenyl and halophenyl; and R_1 is selected from the group consisting of a hydrogen atom, lower alkyl and a hydroxymethyl group
and the acid addition salts thereof.

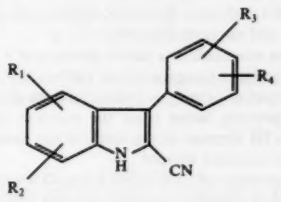
4,069,230

PREPARATION OF INDOLE DERIVATIVES

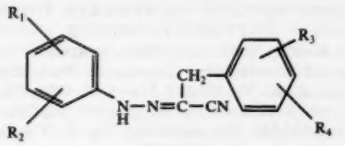
Shigeaki Morooka, Nishinomiya; Katsumi Tamoto, and Akira Matuura, both of Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 1, 1976, Ser. No. 691,777
Claims priority, application Japan, June 4, 1975, 50-67765; June 9, 1975, 50-70056
Int. Cl.[2] C07D *209/04*
U.S. Cl. 260—319.1 7 Claims

1. A process for producing indole derivatives of the formula,



wherein R_1 and R_2 each are hydrogen, halogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro, cyano or trifluoromethyl or, when taken together, form methylenedioxy; R_3 is hydrogen, halogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro, cyano or dimethylamino; and R_4 is hydrogen or halogen, which comprises cyclizing a hydrazone derivative of the formula,



wherein R_1, R_2, R_3 and R_4 are as defined above, with an acidic condensing agent.

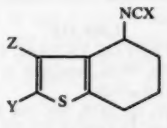
4,069,231

BENZOTHIENYLISOCYANATES AND ISOTHIOCYANATES AND METHOD OF PREPARATION THEREOF

Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 658,153, Feb. 17, 1976, abandoned, which is a division of Ser. No. 458,272, April 5, 1974, Pat. No. 3,972,895.
This application Oct. 22, 1976, Ser. No. 734,681
Int. Cl.[2] C07D *333/16, 333/00*; A01N *9/00, 9/12*
U.S. Cl. 260—332.3 P 5 Claims

1. A compound of the formula:



wherein X is a member selected from the group consisting of sulfur and oxygen; Y is a member selected from the group consisting of cyano, and methyl carbonyl; and Z is hydrogen.

4,069,232

MANUFACTURE OF GAMMA-BUTYROLACTONES FROM 1,3-GLYCOLS AND ESTERS, HALIDES AND METADIOXANES THEREOF

David Horvitz, and William D. Baugh, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 641,800
Int. Cl.[2] C07D *307/20*
U.S. Cl. 260—343.6 9 Claims

1. A method of manufacturing gamma-butyrolactones which comprises reacting

a 1,3 difunctional compound selected from the group consisting of 1,3 glycols, the esters, halides and metadioxanes thereof, and mixtures thereof

with carbon monoxide at a partial pressure of 1 to 500 atmospheres and at a temperature of 120° to 325° C.

in the presence of a catalytic amount of from about 0.01 to 10 weight percent, based upon the reaction mixture, of a Group VIII element in the form of the metal or a compound or complex thereof

and in the presence of from about 1.0 to 40 weight percent of an iodine or bromine promoter for said catalyst

said reacting being conducted for a period of between about 5 and 15 hours, sufficient to produce gamma-butyrolactone as a major product, and

isolating and recovering said gamma-butyrolactone.

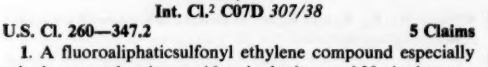
4,069,233

FLUOROALIPHATICSULFONYL SUBSTITUTED ETHYLENES SUBSTITUTED BY FURYL, THENYL, OR 1H-PYRROLYL GROUPS

Robert J. Koshar, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 455,141, March 27, 1974, Pat. No. 3,984,357, which is a division of Ser. No. 300,754, Oct. 25, 1972, Pat. No. 3,932,526. This application May 7, 1976, Ser. No. 684,167
Int. Cl.[2] C07D *307/38*
U.S. Cl. 260—347.2 5 Claims

1. A fluoroaliphaticsulfonyl ethylene compound especially suited as a catalyst in epoxide, vinyl ether, and N-vinyl monomer polymerization and having the formula



wherein R_f is monovalent, saturated fluoroalkyl radical having from 1 to 18 carbon atoms; X is a monovalent, nonionic, electron withdrawing radical at least as electron withdrawing as a benzoyl radical selected from the group consisting of a cyano, phenylcarbonyl, alkylcarbonyl, perfluoroalkylcarbonyl of 2 to 18 carbon atoms, phenylsulfonyl, perfluoroalkylsulfonyl of 1–18 carbon atoms, nitro, fluorosulfonyl, or chlorosulfonyl group; R is hydrogen, an alkyl group, or a phenyl group; R′ is the same as R with at least one being hydrogen; *n* is an integer from 0 to 7 depending on Z; n is 1 to 7 when Z is 2-furyl; *n* is zero when Z is a monovalent unsaturated, conjugated heterocyclic organic radical selected from the group consisting of furyl, thenyl and 1H-pyrrolyl.

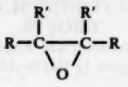
4,069,234

PREPARATION OF VICINAL EPOXIDES

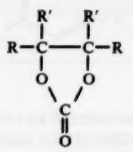
Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 10, 1974, Ser. No. 459,628
Int. Cl.[2] C07D *301/02*
U.S. Cl. 260—348.16 5 Claims

1. A process for the preparation of a vicinal epoxide having 2 to 30 carbon atoms per molecule of the general formula



wherein each R and each R′ are individually selected from the group consisting of hydrogen and hydrocarbyl radical groups having 1 to 10 carbon atoms and wherein R′ radicals in said epoxide can represent a divalent aliphatic hydrocarbon radical which together with the oxirane group in said epoxide can form a cycloaliphatic nucleus, which comprises heating the corresponding carbonate ester having the general formula



wherein R and R′ are as defined above, in the presence of a catalytic amount amount of a phosphonium halide catalyst having the general formula R''_4PX, wherein R″ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl and combinations thereof having from 1 to 10 carbon atoms and X is selected from the group consisting of chlorine, bromine and iodine.

4,069,235

METHOD FOR MANUFACTURE OF POLY-FATTY ACIDS

Osamu Suzuki, Yokohama; Keizo Tanabe, Tokyo, and Tetsutaro Hashimoto, Urawa, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 653,218
Claims priority, application Japan, Jan. 31, 1975, 50-13703; Nov. 19, 1975, 50-138198
Int. Cl.[2] C08H *3/00*
U.S. Cl. 260—407 4 Claims

1. A method for the manufacture of a poly-fatty acid, which comprises:

continuously flowing and contacting at least one straight chain or branched chain ethylenically unsaturated fatty acid having a 8 to 22 carbon atoms with a synthetic silica-alumina catalyst having a composition of 69 to 72 weight % SiO_2, 27 to 30 weight % Al_2O_3 not more than 1 weight % Fe_2O_3, not more than 1 weight % CaO and not more than 1 weight % MgO and having phosphoric acid supported thereon in an amount of 0.1 to 2.0 milli-equivalent per gram of said synthetic silica-alumina catalyst and maintaining the temperature of the reaction in a range of 150° C to 330° C, whereby said fatty acid is polymerized.

2. The method according to claim 1, wherein the ethylenically unsaturated fatty acid having 8 to 22 carbon atoms is selected from the group consisting of oleic acid, linoleic acid, linolenic acid, α-eleostearic acid, β-eleostearic acid, ricinoleic acid, ricinelaidic acid and fatty acids derived from tall oil, sybean oil, linseed oil, cotton seed oil, safflower oil, castor oil and tung oil.

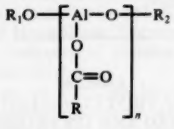
4,069,236

ALUMINUM ACYLOXIDES

Robert B. Hutchison, Cincinnati, Ohio, and C. William Blewett, Fort Mitchell, Ky., assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Oct. 1, 1971, Ser. No. 185,805
Int. Cl.[2] C11C *1/00*
U.S. Cl. 260—414 4 Claims

1. Aluminum acyloxides having the formula



wherein R is a branched chain, saturated, aliphatic radical containing from about 9 to about 24 carbon atoms, R_1 and R_2 are either lower alkyl groups or acyl groups, and *n* is a whole number of between 5 and 60.

4,069,237

PROCESS FOR MAKING TETRA (METHYL-ETHYL) LEAD COMPOUNDS

Charles Anthony Sandy, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 13, 1976, Ser. No. 731,922
Int. Cl.² C07F *7/26*
U.S. Cl. 260—437 R **10 Claims**

1. A process for preparing tetra(methyl-ethyl) lead redistribution compounds comprising reacting tetraethyl lead with about 0.5 to 4 moles of CH_3X per mole of tetraethyl lead, in the presence of a catalytic amount of AlY_3, wherein X and Y are independently chloride, bromide or iodide, at a temperature up to about 130° C, with the proviso that the reaction is conducted in the presence of an iodine-source selected from AlI_3, elemental iodine or C_1 to C_4 alkyl iodide.

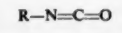
4,069,238

MANUFACTURE OF ALIPHATIC ISOCYANATES

Fritz Zanker, Worms, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

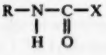
Filed Jan. 16, 1976, Ser. No. 649,740
Claims priority, application Germany, Jan. 28, 1975, 2503270
Int. Cl.² C07C *118/00*
U.S. Cl. 260—453 P **7 Claims**

1. A process for the manufacture of an aliphatic isocyanate of the formula



I

where R is an aliphatic radical of 1 to 10 carbon atoms, by thermal decomposition of an aliphatic carbamic acid halide of the formula



II

where R has the above meaning and X is halogen, in the presence of an inert organic solvent, wherein the thermal decomposition is carried out in the presence of the inert organic solvent in a first reaction vessel for not longer than is required to set up the equilibrium of the thermal decomposition reaction, the hydrogen halide eliminated during this stage is removed through a reflux condenser, the carbamic acid halide/isocyanate mixture obtained in the first reaction vessel is transferred into a second reaction vessel, the thermal decomposition of the remaining carbamic acid halide is continued therein whilst passing inert gas through the mixture, the hydrogen halide entrained with the inert gas which is discharged from the second vessel is reacted with isocyanate at a temperature below the decomposition temperature by passing the hydrogen halide and inert gas in contact with an isocyanate of the formula I, thereby producing carbamic acid halide and purifying the inert gas of hydrogen halide, the mixture containing carbamic acid halide thus obtained is introduced into the first reaction vessel and the purified inert gas is recycled to the second reaction vessel.

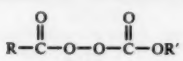
4,069,239

THERMALLY STABLE HIGH MOLECULAR WEIGHT ACYL PEROXYCARBONIC ESTERS

Roger N. Lewis, Martinez; Ronald L. Pastorino, Larkspur, and James F. Wilts, Richmond, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 696,463, June 16, 1976, Pat. No. 4,051,310.
This application Mar. 7, 1977, Ser. No. 774,833
Int. Cl.² C07C *69/96, 71/00*
U.S. Cl. 260—463 **8 Claims**

1. Acyl peroxycarbonic esters of the formula:



where R is selected from methyl and ethyl; and R′ is an alkyl group which together with R contains a total of 17 to about 25 carbon atoms.

4,069,240

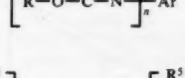
NUCLEAR HYDROGENATION OF N-ARYL CARBAMATES

Russell E. Malz, Jr., Naugatuck, and Harold Greenfield, Watertown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

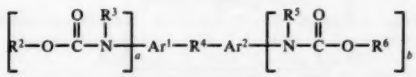
Filed Sept. 4, 1975, Ser. No. 610,359
Int. Cl.² C07C *125/06*
U.S. Cl. 560—115 **18 Claims**

1. A method of making an N-alicyclic carbamate comprising contacting an N-aryl carbamate with hydrogen in an inert solvent medium in the presence of a metal hydrogenation catalyst selected from the group consisting of rhodium, acid-treated rhodium, ruthenium, palladium, acid-treated palladium, nickel, cobalt and acid-treated platinum catalyst, whereby nuclear hydrogenation of the said N-aryl carbamate takes place to form the said N-alicyclic carbamate, the said N-aryl carbamate being selected from the group consisting of those of the formulas I and II as follows:

I



II



wherein, in formula I: *n* is an integer having a value from 1 to 3; R is alkyl having from 1 to 18 carbon atoms, a cycloalkyl group having from 5 to 8 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an aralkyl or alkaryl group having from 7 to 12 carbon atoms; R^1 is hydrogen, an alkyl group having from 1 to 8 carbon atoms, a cycloalkyl group having from 5 to 8 carbon atoms, or an aryl group having from 6 to 12 carbon atoms; and Ar is an aryl group having a valence of *n* and having from 6 to 18 carbon atoms, containing up to 4 fused rings;

and wherein, in formula II: *a* and *b* are integers having values of 1 or 2; R^2 and R^6 are the same or different and have meanings stated for R in formula I; R^3 and R^5 are the same or different and have meanings stated for R^1 in formula I; R^4 is a single bond, —O—, C_1–C_8 alkylene, C_5–C_8 cycloalkylene, C_2–C_8 alkylidene, or C_2–C_8 alkenylene; and Ar^1 and Ar^2 are the same or different and are divalent or trivalent groups derived from radicals having the meanings assigned to Ar in formula I;

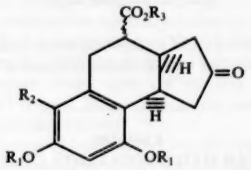
the said method being carried out at a temperature of 25°–200° C and a pressure of 100 to 2500 psi.

4,069,241
STEROIDAL INTERMEDIATES FROM THE CONDENSATION PRODUCT OF DIMETHYL-3-KETOGLUTARATE AND GLYOXAL

Ulrich Weiss, Bethesda, and Kenner C. Rice, Rockville, both of Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed May 26, 1976, Ser. No. 690,361
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—53 6 Claims

1. A tetrahydrocyclopentano[a]naphthalene compound of the formula

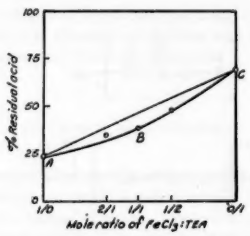


wherein
R_1 is H, acetyl, or methyl;
R_2 is hydrogen or carbomethoxy;
R_3 is hydrogen or methyl.

4,069,242
PROCESS FOR PREPARATION OF β-HYDROXY ESTERS BY REACTION OF ORGANIC CARBOXYLIC ACIDS AND VICINAL EPOXIDES

Arthur E. Gurgiolo, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 797,184, Feb. 6, 1969, abandoned. This application Sept. 9, 1971, Ser. No. 179,166
Int. Cl.[2] C07C *67/26*
U.S. Cl. 560—93 16 Claims



1. In the process of preparing a β-hydroxyester comprising reacting by contacting an organic carboxylic acid and a vicinal epoxide at a temperature between about 60° C and 130° C, the improvement comprising conducting said process in the presence of a catalytic amount of a catalytic composition comprising: (a) a first catalytic compound having at least one amino or ammonium nitrogen atom and selected from the group consisting of ammonia, ethylenediamine, diethylenetriamine, alkylamine, dialkylamine, trialkylamine, trialkanolamine, dialkylarylamine, diarylalkylamine, triarylamine, triaralkylamine, trialkarylamine, dialkylaralkylamine, dialkylalkarylamine, 5- or 6-membered heterocyclic aliphatics which include amino nitrogen within the ring, pyridine, a cross-linked ion-exchange resin bearing a plurality of tertiary amine or quaternary ammonium sites, and tetraalkyl ammonium halides, in combination with (b) a second catalytic compound, which is soluble in each of said acid and epoxide reactants, having an ionizable atom of iron or chromium and is selected from the group consisting of iron halides, chromium halides, ferric alkanoate of 1 to 12 carbon atoms, ferric sulfate, ferric nitrate, ferric alkoxides, and ferric acrylate or methacrylate; the mole ratio of (a) to (b) being from 1:10 to 10:1.

4,069,243
PREPARATION OF TRIFLUOROMETHYLTHIOACETIC ACID AND ITS ESTERS

Robert Michael DeMarinis, King of Prussia, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed May 24, 1976, Ser. No. 689,426
Int. Cl.[2] C07C *148/00, 149/20*
U.S. Cl. 560—153 9 Claims

1. The method of preparing lower alkyl esters of trifluoromethylthioacetic acid comprising reacting a lower alkyl ester of trifluoromethyldithioacetic acid with a tertiary phosphine of the structure:

$$P(R_1)_3$$

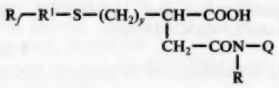
in which each R_1 is lower alkyl having not more than 10 carbon atoms, phenyl or benzyl in an aprotic organic solvent in which the reactants are soluble and which is inert under the reaction conditions.

4,069,244
FLUORINATED AMPHOTERIC AND CATIONIC SURFACTANTS

Karl Friedrich Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

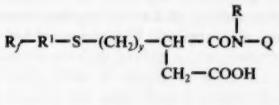
Filed Jan. 3, 1975, Ser. No. 538,432
Int. Cl.[2] C07C *101/04;* C07D *207/08;* C11D *1/00;* B01F *17/28*
U.S. Cl. 260—501.12 13 Claims

1. A compound of the formula



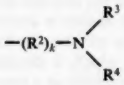
I

or its amphoteric tautomer or of the formula



II

or its amphoteric tautomer or a mixture thereof wherein
R_f is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;
R^1 is branched or straight chain alkylene of 1 to 12 carbon atoms;
Y is 1 or zero;
R is hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms, and
Q is an aliphatic amino group of the formula



wherein
R^2 is a linear or branched alkylene of 2 to 12 carbon atoms;
k is 1 or zero;
R^3 and R^4 are independently of each other hydrogen, alkyl of 1 to 20 carbon atoms or said alkyl substituted by an alkyl group of 1 to 5 carbons.

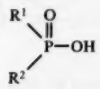
4,069,245
PREPARATION OF PHOSPHONIC AND/OR PHOSPHINIC ACIDS

Walter Dursch, Schneidhain, Taunus; Hans-Jerg Kleiner, Kronberg, Taunus, and Horst-Dieter Thamm, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 29, 1975, Ser. No. 609,093
Claims priority, application Germany, Aug. 31, 1974, 2441878
Int. Cl.[2] C07F *9/30, 9/38;* C07C *27/00*
U.S. Cl. 260—502.4 R **14 Claims**

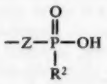
1. A process for the preparation of methyl alcohol and phosphonic and/or phosphinic acids of the formula (I)

(I)



where R^1 is an alkyl radical having from 1 to 20 carbon atoms, an alkenyl radical having from 2 to 20 carbon atoms, an aralkyl radical having from 7 to 12 carbon atoms or an aryl radical having from 6 to 10 carbon atoms, these radicals optionally being mono- to trisubstituted by Cl, Br, alkyl or alkoxy groups each having from 1 to 4 carbon atoms; or R^1 is a radical of the formula (Ia)

(Ia)

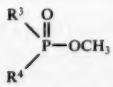


where Z is an alkylene radical having from 2 to 6 carbon atoms, a phenylene, biphenylene, naphthylene radical or a radical of the formula (Ib)

(Ib)

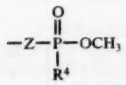
where n_1 and n_2 are identical or different integers of from 1 to 4, and R^2 in the formulae (I) and (Ia) is either as defined for R^1, except the radical of formula (Ia), R^1 and R^2 being either identical or different, or OH; by hydrolytic cleavage of phosphonic and/or phosphinic acid alkyl esters of the formula (II)

(II)



where R^3 is as defined above for R^1 except the radical of formula (Ia), or a radical of the formula (IIa)

(IIa)



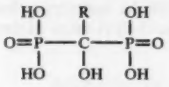
where Z is as defined in formula (Ia), and R^4 in formulae (II) and (IIa) is either as defined for R^3 except the radical of formula (IIa), R^3 and R^4 being either identical or different, or OCH_3 or OH; in the presence of the phosphonic and/or phosphinic acid of formula (I), which comprises carrying out the hydrolysis at atmospheric pressure and at a temperature of from 160 to 250° C, with the use of at least a stoichiometric amount of water, and by distilling off the methyl alcohol formed, optionally together with water.

4,069,246
PRODUCTION OF 1-HYDROXY-ALKANE-1,1-DIPHOSPHONIC ACIDS

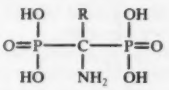
Helmut Blum, and Karl-Heinz Worms, both of Dusseldorf-Holthausen, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

Continuation-in-part of Ser. No. 525,156, Nov. 19, 1974, abandoned, which is a continuation of Ser. No. 317,663, Dec. 22, 1972, abandoned. This application June 3, 1976, Ser. No. 692,326
Claims priority, application Germany, Dec. 31, 1971, 2165833
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.4 P **8 Claims**

1. A process for the preparation of 1-hydroxy-alkane-1,1-diphosphonic acid of the formula



wherein R is a member having from 1 to 12 carbon atoms selected from the group consisting of alkyl having 1 to 6 carbon atoms, cyclohexyl, phenyl and phenylalkyl, all having substituents selected from the group consisting of hydrogen, methyl, ethyl, methoxy, ethoxy and halogen, consisting essentially of reacting the corresponding 1-amino-alkane-1,1-diphosphonic acid of the formula



in which R has the above-assigned meaning, with at least the stoichiometric amount of aqueous nitrous acid, at a temperature between 0° and 50° C; and recovering said 1-hydroxy-alkane-1,1-diphosphonic acid.

4,069,247
PREPARATION OF PHOSPHONIC AND/OR PHOSPHINIC ACIDS

Hans-Jerg Kleiner, Kronberg, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 29, 1975, Ser. No. 609,080
Claims priority, application Germany, Aug. 31, 1974, 2441783
Int. Cl.[2] C07F *9/30, 9/38;* C07C *27/00*
U.S. Cl. 260—502.4 R **13 Claims**

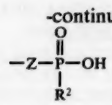
1. A process for the preparation of alkyl alcohols and phosphonic and/or phosphinic acids of the formula (I)

(I)

where R^1 is an alkyl radical having from 1 to 20 carbon atoms, an alkenyl radical having from 2 to 20 carbon atoms, an aralkyl radical having from 7 to 12 carbon atoms or an aryl radical having from 6 to 10 carbon atoms, these radicals optionally being mono- to trisubstituted by Cl, Br, alkyl or alkoxy groups each having from 1 to 4 carbon atoms; or R^1 is a radical of the formula (Ia)

(Ia)

-continued

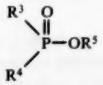


where Z is an alkylene radical having from 2 to 6 carbon atoms, a phenylene, biphenylene, naphthylene radical or a radical of the formula (Ib)

(Ib)

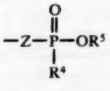
wherein n_1 and n_2 are identical or different integers of from 1 to 4, and R^2 in the formulae (I) and (Ia) is either as defined for R^2, except the radical of formula (Ia), R^1 and R^2 being either identical or different, or OH; by hydrolytic cleavage of phosphonic and/or phosphinic acid alkyl esters of the formula (II)

(II)



where R^3 is as defined above for R^1 except the radical of formula (Ia), or a radical of the formula (IIa)

(IIa)



where Z is as defined in formula (Ia), and R^4 in formulae (II) and (IIa) is either as defined for R^3 except the radical of formula (IIa), R^3 and R^4 being either identical or different, or OR^5 or CH, R^5 being a straight-chain or branched alkyl group having from 2 to 8 carbon atoms, optionally being substituted by chlorine or bromine; in the presence of the phosphonic and/or phosphinic acid of formula (I), which comprises carrying out the hydrolysis at atmospheric pressure and at a temperature of from 170° to 300° C, with the use of at least a stoichiometric amount of water, and by distilling off the alcohol formed, optionally with water.

4,069,248

HYDROLYSIS OF AROMATIC NITRILES TO CARBOXYLIC ACIDS

William D. Vanderwerff, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 602,613, Aug. 7, 1975, abandoned. This application Dec. 3, 1976, Ser. No. 747,152

Int. Cl.[2] C07C *51/08*

U.S. Cl. 260—515 P **6 Claims**

1. In the process of a non-catalytic aqueous equilibrium hydrolysis to the corresponding carboxylic acid of an aromatic nitrile obtained by ammoxidation of an alkyl-substituted hydrocarbon, the improvement which consists of increasing the ionic strength of the hydrolysis medium solution by adding to the nitrile prior to said hydrolysis an inert, neutral salt selected from the group of alkali metal sulfates, phosphates, and perchlorates in an amount from about 0.5 to about 2.0 moles per liter of aqueous medium whereby the content of nitrogen impurities in the acid product is reduced.

4,069,249

N,N-DI-(HYDROXYBENZYL)-TRIMETHYLENE DIAMINEDIACETIC ACIDS

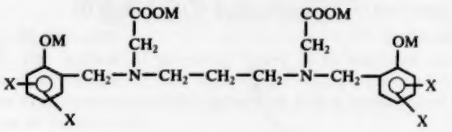
Roger Robert Gaudette, Hudson, N.H.; John Leonard Ohlson, Bedford, and Patricia Marie Scanlon, Arlington, both of Mass., assignors to W. R. Grace & Co., New York, N.Y.

Filed Nov. 11, 1975, Ser. No. 630,792

Int. Cl.[2] C07C *101/447, 143/67*

U.S. Cl. 260—519 **8 Claims**

1. A compound having the formula



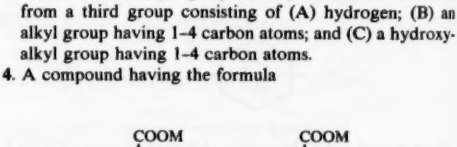
in which:

a. each X is a member selected from a first group consisting of (i) hydrogen; (ii) an alkyl group having 1–4 carbon atoms; (iii) $-SO_3M$; and (iv) —COOM;

b. M is a member selected from a second group consisting of (i) a hydrogen ion; (ii) an alkali metal ion; (iii) one-half an alkaline earth metal ion; and (iv) an ammonium ion having the formula

in which each of R_1, R_2, R_3, and R_4 is a member selected from a third group consisting of (A) hydrogen; (B) an alkyl group having 1–4 carbon atoms; and (C) a hydroxyalkyl group having 1–4 carbon atoms.

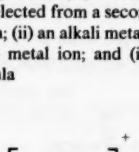
4. A compound having the formula



in which:

a. each X is a member selected from a first group consisting of (i) hydrogen; (ii) an alkyl group having 1–4 carbon atoms; (iii) $-SO_3M$; and (iv) —COOM;

b. M is a member selected from a second group consisting of (i) a hydrogen ion; (ii) an alkali metal ion; and (iii) one-half an alkaline earth metal ion; and (iv) an ammonium ion having the formula



in which each of R_1, R_2, R_3, and R_4 is a member selected from a third group consisting of (A) hydrogen; (B) an alkyl group having 1–4 carbon atoms; and (C) a hydroxyalkyl group having 1–4 carbon atoms.

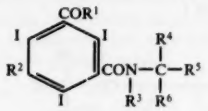
4,069,250

SUBSTITUTED 2,4,6-TRIIODOISOPHTHALAMIC ACIDS

Philip E. Wiegert, St. Louis, Mo., assignor to Mallinckrodt, Inc., Mo.

Continuation of Ser. No. 479,716, June 17, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,169
Int. Cl.[2] C07C *103/32;* A61K *29/02*
U.S. Cl. 260—519 13 Claims

1. A compound having the formula:



wherein

R^1 is hydroxy, or OM, M being a pharmaceutically acceptable cation,

R^2 is an acetamido or methoxyacetamido function,

R^3 is hydrogen, R^4 is a methyl or hydroxymethyl function and each R^5 and R^6 is a hydroxymethyl function

4,069,251

CONTINUOUS PROCESS FOR THE MANUFACTURE OF METHIONINE

Sven Peter Mannsfeld; Arno Pfeiffer, both of Bruhl; Herbert Tanner, Grossauheim; Hans Wagner, Constance, all of Germany, and Erich Liebetanz, deceased, late of Mainz, Germany (by Eva Angela Liebetanz, heiress), assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 328,106, Jan. 30, 1973, abandoned, which is a continuation of Ser. No. 9,458, Feb. 6, 1970, abandoned. This application Aug. 12, 1976, Ser. No. 713,822
Claims priority, application Germany, Feb. 8, 1969, 1906405
Int. Cl.[2] C07C *149/247*
U.S. Cl. 260—534 S 11 Claims

1. A continuous process for the production of methionine comprising the steps of

1. hydrolyzing 5-(2-methylmercaptoethyl)hydantoin in an aqueous solution of an alkali-metal carbonate or bicarbonate or mixture thereof at a superatmospheric pressure and at a temperature between 120° and 220° C while
2. removing the ammonia and carbon dioxide formed during the hydrolysis;
3. after completion of the hydrolsis reaction cooling the solution;
4. precipitating the methionine by means of carbon dioxide and separating and recovering the methionine from the remaining mother liquor;
5. replenishing the mother liquor containing the alkali metal carbonate or bicarbonate and residual methionine with fresh 5-(2-methylmercaptoethyl)hydantoin and then
6. recycling the replenished mother liquor including residual methionine for further hydrolysis and treatment as in steps 1 to 5.

4,069,252

PROCESS FOR THE PREPARATION OF CERTAIN ACYL CYANIDE COMPOUNDS

Kurt Findeisen, Odenthal; Wilfried Draber, Wuppertal, and Herbert Schwarz, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 4, 1976, Ser. No. 693,827
Claims priority, application Germany, June 25, 1975, 2528211
Int. Cl.[2] C07C *63/04, 120/04*
U.S. Cl. 260—545 R 13 Claims

1. In a process for the preparation of an acyl cyanide compound of the general formula

in which

R is alkyl of from 1 to 4 carbon atoms, or phenyl optionally substituted by alkoxy of from 1 to 4 carbon atoms

which process comprises reacting an acid halide of the general formula

in which

R is identified as above and

X represents halogen,

with anhydrous hydrocyanic acid

which improvement comprises carrying out the reaction in the presence of an aliphatic, araliphatic or alicyclic tertiary amine, at a temperature between −70° C and +100° C.

4,069,253

PROCESS FOR THE PRODUCTION OF WATER-FREE MOLTEN UREA

Kazumichi Kanai, Fujisawa; Tetsuo Kimura, Kamakura, and Akito Fukui, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated and Toyo Engineering Corporation of Japan, both of Tokyo, Japan

Continuation of Ser. No. 155,230, June 21, 1971, abandoned. This application Feb. 6, 1976, Ser. No. 656,010
Claims priority, application Japan, July 1, 1970, 45-57413
Int. Cl.[2] C07C *126/00*
U.S. Cl. 260—555 C 6 Claims

1. A process for concentrating an aqueous urea solution to a substantially water-free molten urea which comprises subjecting said aqueous urea solution to a first evaporation in a first evaporation zone at a temperature of from 40° C to 120° C to form a urea slurry, said slurry comprising urea crystals suspended in a saturated solution of urea, said crystals being from 10 to 60 percent by weight of the weight of said urea slurry, and subjecting said urea slurry to a second evaporation in a second evaporation zone at a temperature above 132.7° C to dissolve the urea crystals and form a substantially water-free molten urea.

4,069,254

ω-(ARYLSULFONAMIDO)-ALKYLAMINE

Hiroyoshi Hidaka, Kasugai; Ikuo Matsumoto, Tokyo; Masaaki Hosoi, Kawasaki, and Nobuo Aoki, Utsunomiya, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo; Hiroyoshi Hidaka, Aichi and Nobuo Aoki, Tochigi, all of, Japan

Filed Oct. 7, 1975, Ser. No. 620,274
Claims priority, application Japan, Aug. 22, 1975, 50-101125
Int. Cl.[2] C07C *143/78;* A61K *31/18*
U.S. Cl. 260—556 AR 9 Claims

1. A ω-(arylsulfonamido)alkylamine having the formula

, $R'\text{-}SO_2NH(CH_2)_nNH_2$

wherein R′ is halonaphthyl; and *n* is an integer of 5 - 8.

4,069,255

PREPARATION OF ACRYLAMIDE

Michael Martan, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 30, 1976, Ser. No. 728,353
Int. Cl.[2] C07C *103/133*
U.S. Cl. 260—561 N 11 Claims

1. A process for the preparation of acrylamide which comprises treating acrylonitrile with water at hydrolysis conditions

in the presence of a catalyst comprising finely divided metallic copper and prepared by volatilizing copper metal, subsequently cooling the copper vapors in contact with an organic solvent and heating to ambient temperature, and recovering the resultant acrylamide.

4,069,256

ANTI-INFLAMMATORY PHENYL-LOWER-ALKYLAMINES

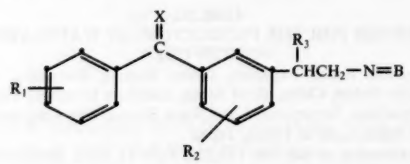
Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 542,553, Jan. 20, 1973, abandoned. This application Dec. 17, 1975, Ser. No. 641,511

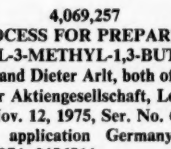
Int. Cl.[2] C07C *87/28*

U.S. Cl. 260—570 R **4 Claims**

1. A member of the group consisting of (A) compounds having the formula:



where R_1 represents hydrogen or from one to two, the same or different, lower-alkyl, hydroxy, lower-alkoxy, trifluoromethyl, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl or halogen selected from fluorine, chlorine and bromine; R_2 represents hydrogen, or lower-alkoxy or hydroxy in the 4-position, or lower-alkyl in either of the 2-, 4-, 5- or 6-positions; R_3 represents hydrogen or lower-alkyl; the group >C=X represents >C=O; and N=B represents the group



where R_4 represents lower-alkyl and (B) acid-addition salts thereof.

4,069,257

PROCESS FOR PREPARING 2-ACETYL-3-METHYL-1,3-BUTADIENE

Reinhard Lantzsch, and Dieter Arlt, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 12, 1975, Ser. No. 631,262

Claims priority, application Germany, Nov. 29, 1974, 2456413; Nov. 29, 1974, 2456514

Int. Cl.[2] C07C *45/18*

U.S. Cl. 260—595 **6 Claims**

1. A process for preparing 2-acetyl-3-methyl-1,3-butadiene which comprises:

A. contacting mesityl oxide with formaldehyde in the presence of 0.1 to 10 mol percent of a bicyclic amidine per mol of mesityl oxide whereby to obtain 2-methyl-3-hydroxymethyl-pent-1-en-4-one; and B. heating said 2-methyl-3-hydroxymethyl-pent-1-en-4-one at 300° to 600° C until it decomposes.

4,069,258

CYCLOPENTENE DERIVATIVES

Werner Hoffmann, Neuhofen, and Karl von Fraunberg, Bobenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

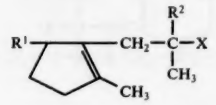
Filed Mar. 15, 1976, Ser. No. 666,630

Claims priority, application Germany, Mar. 29, 1975, 2513996

Int. Cl.[2] C07C *45/00, 47/40*

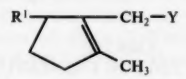
U.S. Cl. 260—598 **1 Claim**

1. A process for the manufacture of a cyclopentene derivative of the formula I



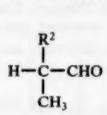
I

where R^1 is isopropyl or isopropenyl, R^2 is alkyl of 1 to 3 carbon atoms, X is CHO which comprises: reacting a compound of the formula II



II,

where Y is halogen with an aldehyde of the formula III



III,

in the presence of an aqueous solution of a strong base and in the presence of a catalytic amount of a quaternary ammonium salt.

4,069,259

PROCESS FOR PREPARING ORGANIC DISULFIDES

Divna Cipris, Morristown, N.J., and Dirk Pouli, Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

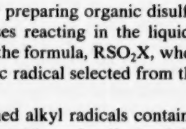
Filed Oct. 19, 1976, Ser. No. 733,727

Int. Cl.[2] C07C *149/12;* C07D *277/78, 263/58, 235/28*

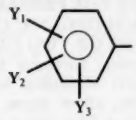
U.S. Cl. 260—608 **11 Claims**

1. A process for preparing organic disulfides free of sulfinic acid hich comprises reacting in the liquid phase an organic sulfonyl halide of the formula, RSO_2X, wherein X is a halogen and R is an organic radical selected from the group consisting of:

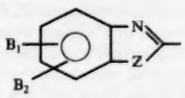
linear or branched alkyl radicals containing 1 to 18 carbon atoms; sutstituted benzyl radicals of the formula:



wherein the substituents A_1 to A_3 are independently selected from hydrogen, halogen and alkoxy containing 1 to 4 carbon atoms; cycloalkyl radicals containing 5 to 8 carbn atoms and 0 to 2 chlorine atoms; aromatic radicals of the formula:



wherein Y_1, Y_2 and Y_3 are independently selected from hydrogen, halogen, alkyl containing 1 to 12 carbon atoms, alkoxy containing 1 to 4 carbon atoms, phenyl and a fused benzene ring formed from two adjacent Y substituents; heterocyclic radicals of the formula:



wherein Z is either oxygen, nitrogen or sulfur, and B_1 and B_2 are independently selected from hydrogen, halogen and alkoxy containing 1 to 4 carbon atoms, with a mercaptan of the formula, R'SH, wherein R' may be the same as R or different and is a member of the group as defined above for R, in a ratio of at least about 5 moles of mercaptan per mole of organic sulfonyl halide.

4,069,260

PREPARATION OF UNSATURATED ALCOHOLS

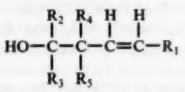
Spencer C. Watson; Dennis B. Malpass, and G. Scott Yeargin, all of Laporte, Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Division of Ser. No. 395,888, Sept. 10, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,749

Int. Cl.[2] C07C *29/00, 33/02, 33/06, 33/10*

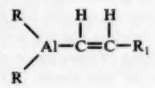
U.S. Cl. 260—632 B **8 Claims**

1. A process of preparing a predominately cis-unsaturated alcohol having the following formula:



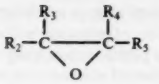
wherein R_1 is a straight or branched chain alkyl group having 1 to 16 carbon atoms, R_2, R_3, R_4 and R_5 can be the same or different and are selected from hydrogen, a straight or branched chain alkyl group having 1 to 12 carbon atoms, an aryl radical having 6 to 10 carbon atoms, said aryl radical can be substituted with an alkyl group having 1 to 6 carbon atoms, an alkoxy radical having 1 to 6 carbon atoms and halogen; comprising the steps of:

a. pre-coordinating a predominately cis-1-alkenyl aluminum dialkyl compound having the following formula:



wherein R can be selected from lower alkyl having 1 to 6 carbon atoms and R_1 has been previously defined; with at least one molar equivalent of a Lewis base,

b. reacting said product of step (a) with an epoxide compound having the following formula:



wherein R_2, R_3, R_4 and R_5 have been previously defined, said reaction being carried out at a temperature of between −80° C. and 130° C.;

c. treating the reaction product of steps (a) and (b) with an aqueous solution of a mineral acid, to yield the cis-unsaturated alcohol compounds.

4,069,261

PROCESS FOR THE PRODUCTION OF POLYHYDRIC ALCOHOLS

Sunao Kyo; Katsuhiko Hayashi; Hidetsugu Tanaka, and Hideaki Oka, all of Ibaragi, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation of Ser. No. 420,849, Dec. 3, 1973, abandoned. This application Sept. 2, 1975, Ser. No. 609,722

Claims priority, application Japan, Dec. 2, 1972, 47-120964

Int. Cl.[2] C07C *29/00*

U.S. Cl. 260—635 E **7 Claims**

1. Process for the production of polyhydric alcohols from a substituted 1,3-dioxane containing at least one hydroxy alkyl group in the molecule which comprises heating said 1,3-dioxane or mixtures thereof in contact with boric acid anhydride or a boric acid compound selected from the group consisting of boric acid, metaboric acid, hypoboric acid, tetraboric acid and their esters at a temperature of from about 90° C. to 180° C., blowing water in the form of steam into the reaction system and recovering said polyhydric alcohol.

4,069,262

PREPARATION OF 2-FLUORONITROBENZENE

Robert Allison Kunz, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1977, Ser. No. 775,038

Int. Cl.[2] C07C *79/12*

U.S. Cl. 260—646 **13 Claims**

1. A process for preparing 2-fluoronitrobenzene which comprises heating a mixture of 2-chloronitrobenzene potassium fluoride of particle size 1–20 microns and a catalyst in sulfolane for 2–8 hours at 240°–250° C wherein the molar ratio of 2-chloronitrobenzene to potassium fluoride to sulfolane is 1 : 1.1–1.5 : 0.3–1.0.

4,069,263

PROCESS FOR DIRECTED CHLORINATION OF ALKYLBENZENES

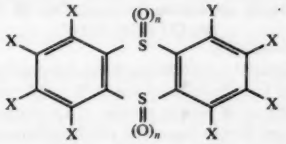
Henry C. Lin, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,449

Int. Cl.[2] C07C *25/04*

U.S. Cl. 260—650 R **20 Claims**

1. A process for the production of nuclear chlorinated alkylbenzenes comprises reacting, in the liquid phase, alkylbenzene with chlorine in the presence of a Lewis acid catalyst and a co-catalyst comprising a thianthrene compound or mixture of thianthrene compounds characterized by the formula:



where *n* is 0 to 1, y is an electron-withdrawing substituent or an

electron-donating substituent and each *x* is hydrogen, an electron-withdrawing substituent or an electron-donating substituent; the total number of electron-withdrawing substituents present at the *x* and *y* positions is at least one and no more than seven; the total number of electron-donating substituents is at least one and no more than four; no more than three electron-donating substituents are present at the peri-positions; and with the proviso that when electron-withdrawing substituents are present at each of the peri-positions, electron-donating substituents are present at each of the 2, 3, 7 and 8 positions.

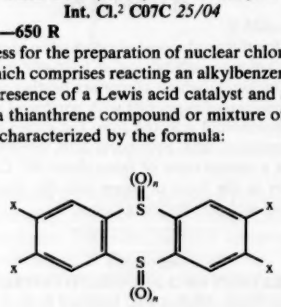
4,069,264

PROCESS FOR DIRECTED CHLORINATION OF ALKYLBENZENES

Henry C. Lin, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,439
Int. Cl.[2] C07C *25/04*
U.S. Cl. 260—650 R **24 Claims**

1. A process for the preparation of nuclear chlorinated alkylbenzenes which comprises reacting an alkylbenzene with chlorine in the presence of a Lewis acid catalyst and a co-catalyst comprising a thianthrene compound or mixture of thianthrene compounds characterized by the formula:



where each *n* is 0 to 1 and each *x* is hydrogen or an electron-withdrawing substituent or an electron-donating substituent with the proviso that at least one *x* is an electron-withdrawing substituent and at least one *x* is an electron-donating substituent.

4,069,265

STABILIZATION OF 1,1,1-TRICHLOROETHANE WITH A FOUR COMPONENT SYSTEM

Hermann Richtzenhain, Much-Schwellenbach, and Rudolf Stephan, Troisdorf-Sieglar, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 408,955, Oct. 23, 1973, Pat. No. 3,959,397, which is a continuation-in-part of Ser. No. 60,173, June 29, 1970, Pat. No. 3,787,509, which is a division of Ser. No. 805,923, Jan. 5, 1969, Pat. No. 3,590,088, which is a division of Ser. No. 609,681, Jan. 16, 1967, Pat. No. 3,445,532, which is a continuation of Ser. No. 316,772, Oct. 16, 1963, abandoned. This application Mar. 1, 1976, Ser. No. 662,999
Claims priority, application Germany, Oct. 18, 1962, 40087
Int. Cl.[2] C07C *17/42*
U.S. Cl. 260—652.5 R **5 Claims**

1. A stabilized 1,1,1-trichloroethane composition consisting essentially of 1,1,1-trichloroethane, 0.05 to 2.0 weight percent of nitrile, 0.05 to 3.0 weight percent of 1,4-dioxane, 0.1 to 2.0 weight percent nitromethane and ethylenediamine, said ethylenediamine being present in an amount of at least 0.01 weight percent, based upon the weight of said 1,1,1-trichloroethane.

4,069,266

PROCESS FOR THE PREPARATION OF FLUORINE-RICH ORGANIC COMPOUNDS CONTAINING ONE OR TWO CARBON ATOMS

Tadaaki Komatsu, Saitama; Hirokazu Takeda, Kamifukuoka; Hideki Oshio; Kimiaki Matsuoka, both of Kawagoe, and Minoru Aramaki, Ube, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 25, 1977, Ser. No. 762,339
Claims priority, application Japan, Jan. 26, 1976, 51-6630
Int. Cl.[2] C07C *17/20*
U.S. Cl. 260—653 **7 Claims**

1. A process for disproportionating a partially or completely halogenated fluoro derivative of methane containing not more than two fluorine atoms and at least one halogen atom other than fluorine or a completely halogenated fluoro derivative of ethane containing from 2 to 4 halogen atoms other than fluorine and correspondingly from 4 to 2 fluorine atoms, the process comprising contacting said derivative of methane or said derivative of ethane in gas phase and in a substantially moisture-free state under disproportionation conditions of a temperature of 100 to 600° C and a space velocity of from 50 to 1000/hr, with a catalyst substantially composed of from 0.1 to 5.0% by weight, as metal, of a metal salt selected from the group consisting of nickel (II) halides, titanium (III) chloride and titanium (III) fluoride and a balance of a compound selected from the group consisting of activated alumina, silica.alumina and aluminum fluoride.

4,069,267

STABLE DIORGANOMAGNESIUM COMPOSITIONS

Conrad W. Kamienski, Gastonia, N.C.; Bobby Joe McElroy, York, S.C., and Ricardo O. Bach, Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Filed Oct. 27, 1976, Ser. No. 736,262
Int. Cl.[2] C07F *3/02*
U.S. Cl. 260—665 R **13 Claims**

1. A stable complex of (a) a di-n-alkylmagnesium in which the alkyl contains from 1 to 4 carbon atoms with (b) a di-n-alkylmagnesium in which the alkyl contains from 6 to 18 carbon atoms.

4,069,268

REGENERATION OF METAL HALIDE CATALYSTS VIA HALOGENATION

Michael Siskin, Maplewood, N.J., and Ronald J. Gillespie, Dundas, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 4, 1975, Ser. No. 628,587
Int. Cl.[2] C07C *5/28, 3/54;* C10G *35/06;* B01J *27/32*
U.S. Cl. 260—666 P **17 Claims**

1. In a hydrocarbon conversion process which comprises contacting a hydrocabon feedstock with a substantially liquid phase catalyst comprising a metal fluoride selected from the group consisting of tantalum pentafluoride, niobium pentafluoride and mixtures thereof in combination with hydrogen fluoride, thereby forming a hydrocarbon phase and a catalyst phase, at least a portion of said catalyst phase having become deactivated due to the presence of organic contaminants and inorganic separating at least a portion of said catalyst phase from said hydrocarbon phase, the improvement which comprises regenerating at least a portion of said catalyst phase in a regeneration zone by contact therein with a halogen selected from the group consisting of fluorine or chlorine at a temperature between about −30° and about 1000° C. for a period of time sufficient to obtain a catalyst possessing a greater activity for hydrocarbon conversion than that possessed by the deactivated catalyst, at least a portion of said contaminants being converted to halogenated or partially halogenated hydrocarbons and volatilized during said regeneration.

14. The process of claim 8 wherein the regeneration zone is

maintained at a temperature ranging from about −30° to about 400° C.

15. The process of claim 14 wherein at least a portion portion of the catalyst phase is hydrolyzed and is contacted with hydrogen fluoride or hydrogen chloride prior to contact with fluorine.

4,069,269

ISOMERIZATION OF NAPHTHENES

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 633,889, Nov. 20, 1975, Pat. No. 4,013,738, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Nov. 1, 1976, Ser. No. 737,353

Int. Cl.² C07C *13/08*

U.S. Cl. 260—666 P 15 Claims

1. A process for isomerizing an isomerizable naphthalene hydrocarbon selected from the group consisting of C_5 to C_9naphthenes which comprises contacting said hydrocarbon at isomerization conditions with a catalyst comprising a porous carrier material containing, on an elemental basis, 0.01 to 2 wt. % platinum group metal, 0.1 to 5 wt. % cobalt, 0.01 to 5 wt. % tin and 0.1 to 10 wt. % halogen, wherein substantially all of the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal and cobalt are present in the elemental metallic state and wherein substantially all of the tin is present in an oxidation state above that of the elemental metal.

4,069,270

ALKYLAROMATIC ISOMERIZATION

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 633,889, Nov. 20, 1975, Pat. No. 4,013,738, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,959,988. This application Nov. 1, 1976, Ser. No. 737,354

Int. Cl.² C07C *15/08*

U.S. Cl. 260—668 A 14 Claims

1. A process for isomerizing alkylaromatic hydrocarbons selected from the group consisting of C_8 alkyl aromatics which comprises contacting said hydrocarbon at isomerization conditions with a catalyst comprising a porous carrier material containing, on an elemental basis, 0.01 to 2 wt. % platinum group metal, 0.1 to 5 wt. % cobalt, 0.01 to 5 wt. % tin and 0.1 to 10 wt. % halogen, wherein substantially all of the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal and cobalt are present in the elemental metallic state and wherein substantially all of the tin is present in an oxidation state above that of the elemental metal.

4,069,271

SILVER CATALYSTS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 580,683, May 23, 1975, Pat. No. 4,005,049. This application July 19, 1976, Ser. No. 706,531

Int. Cl.² C07C *15/00*

U.S. Cl. 260—669 R 3 Claims

1. A process for dehydrogenating ethylbenzene wherein said ethylbenzene is dehydrogenated at a temperature within the range from about 220° to 300° C in the presence of an oxygen-containing gas and a silver/transition metal catalyst, the transition metal being selected from the group consisting of nickel and cobalt.

4,069,272

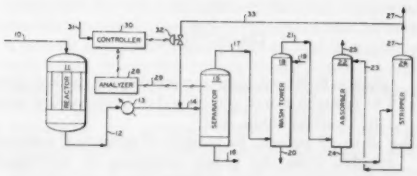
OXIDATIVE DEHYDROGENATION EFFLUENT CONTROL

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 25, 1976, Ser. No. 661,456

Int. Cl.² C07C *11/12*

U.S. Cl. 260—680 E 7 Claims



1. In a process for oxidatively dehydrogenating olefins in the presence of an oxygen-containing gas to produce an effluent containing the corresponding diolefin, unconverted olefins, steam, and oxygen, and cooling of the effluent sufficiently to condense steam leaving a gaseous effluent containing diolefin, unconverted olefins, and oxygen, the improvement for controlling the oxygen concentration below the combustible limit in said gaseous effluent which comprises:

a. measuring the oxygen concentration of said gaseous effluent and producing a signal representative of said concentration, and

b. controlling said oxygen concentration in said effluent responsive to said signal by diluting same with a recycled C_4 hydrocarbon-containing stream introduced into said cooled effluent at a rate sufficient to regulate the residual oxygen concentration in said gaseous effluent to a safe value below 9.5 mole percent.

4,069,273

DIMERIZATION OF LINEAR ALPHA-OLEFINS

Robert G. Komoto, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 24, 1977, Ser. No. 761,916

Int. Cl.² C07C *3/10*

U.S. Cl. 260—683.15 D 4 Claims

1. A process for dimerizing low-molecular-weight linear alpha-olefins which comprises contacting a C_2 to C_8 linear alpha-olefin or mixture of such olefins with a catalyst prepared by the reaction of bis(1,5-cyclooctadiene) nickel(0) and hexafluoro-2,4-pentanedione, wherein the mol ratio of hexafluoropentanedione to nickel is from about 0.5:1 to about 2:1.

4,069,274

THERMOSETTING ACRYLIC POWDER COATING COMPOSITIONS

Minoru Shibata; Naozumi Iwasawa; Tadashi Watanabe, and Ichiro Yoshihara, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Japan

Filed July 25, 1975, Ser. No. 598,946

Claims priority, application Japan, July 31, 1974, 49-87686

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 14 Claims

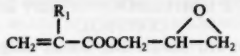
1. A thermosetting powder coating composition which comprises:

A. a functional glycidyl group-containing graft copolymer of

i. 10 to 40 percent by weight of a linear polyester having a number average molecular weight of 600 to 3,000 and containing one terminal carboxyl group and

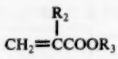
ii. 60 to 90 percent by weight of acrylic copolymer of

ii-a. 6.5 to 60 percent by weight of at least one of glycidyl esters having the formula



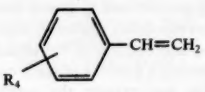
wherein R_1 is hydrogen or methyl,

ii-b. 10 to 93.5 percent by weight of at least one of acrylic monomers having the formula



wherein R_2 is hydrogen or methyl and R_3 is alkyl having 1 to 14 carbo atoms, cyclohexyl or hydroxyalkyl having 1 to 4 carbon atoms, and

ii-c. 0 to 65 percent by weight of additional monomers selected from the group consisting of acrylonitrile, methacrylonitrile and styrenes having the formula



wherein R_4 is hydrogen or alkyl having 1 to 4 carbon atoms,

said graft copolymer having a softening point of 70° to 110° C and a number average molecular weight of 2,000 to 30,000 and containing glycidyl group in an amount of 0.35 to 2.35 moles per kilogram of the graft copolymer; and

B. at least one of polycarboxylic acids and anhydrides thereof in an amount of 0.6 to 1.2 moles in terms of carboxyl group per mole of the glycidyl group contained in the graft copolymer.

4,069,275

POWER PAINT BLEND OF AN EPOXY AND HYDROXY-FUNCTIONAL COPOLYMER AND AN ANHYDRIDE-FUNCTIONAL COPOLYMER

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 426,164, Dec. 19, 1973, Pat. No. 3,959,405. This application Feb. 18, 1976, Ser. No. 659,176

The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.[2] C08L *63/10*

U.S. Cl. 260—836 **2 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, and plasticizers, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactable particulate mixture of

A. an epoxy-functional copolymer of monoethylenically unsaturated monomers consisting essentially of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated carboxylic acid and about 80 to about 95 weight percent of other monoethylenically unsaturated monomers, and having a glass transition temperature in the range of about 40° to about 90° C. and a molecular weight in the range of about 1500 to about 15,000,

B. as crosslinking agent, an anhydride-functional copolymer,

C. 0.05 to about 4 weight percent of a non-reactive polymeric flow control agent based on the weight of said coreactable particulate mixture,

the improvement wherein:

1. said epoxy-functional copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist essentially of difunctional monomers selected from the group consisting of hydroxyethyl acrylates and methacrylates, hydroxypropyl acrylates and methacrylates and hydroxybutyl acrylates and methacrylates in an amount comprising about 2 to about 10 weight percent of said copolymer and monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a $C_1 - C_8$ monohydric alcohol and acrylic acid, esters of a $C_1 - C_8$ monohydric alcohol and methacrylic acid and $C_8 - C_{12}$ monovinyl hydrocarbons, and

2. said anhydride-functional copolymer has molecular weight in the range of about 1500 to about 15,000 and is a copolymer of about 5 to about 20, weight percent of an anhydride of an olefinically unsaturated dicarboxylic acid and about 80 to about 95 weight percent of alpha-beta, monoethylenically unsaturated, quantitatively and qualitatively monofunctional monomers selected from the group consisting of esters of a $C_1 - C_8$ monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid and $C_8 - C_{12}$ monovinyl hydrocarbons, said esters of a $C_1 - C_8$ monohydric alcohol and a monocarboxylic acid comprising in excess of 50 weight percent of said anhydride-functional copolymer, and is present in said coreactive particulate mixture in an amount that provides about 0.4 to about 1.4 anhydride groups per functional group on said epoxy-functional copolymer.

4,069,276

LOW-PRESSURE, NO-COOL PHENOLIC TYPE RESIN FOR DECORATIVE LAMINATES

Leopold F. Bornstein, Atlanta, Ga., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed May 24, 1976, Ser. No. 689,046

Int. Cl.[2] C08L *61/26*; C08G *12/12*

U.S. Cl. 260—839 **5 Claims**

1. A laminating resin composition comprising a thermosetting phenolic resin modified with about 5 to about 10 percent by weight of the resin solids of a partially etherified melamine-formaldehyde resin, said partially etherified melamine-formaldehyde resin comprising the reaction product of from about 10 to 25 percent by weight of melamine, from about 5 to 12 percent by weight of formaldehyde on a dry basis, from about 20 to 40 percent of an aliphatic polyol and from about 10 to 30 percent by weight of furfural.

4,069,277

DYEABLE POLYAMIDES CONTAINING AN ANTISTATIC AGENT

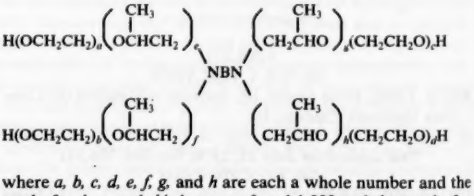
Ronald D. Mathis, and James S. Dix, both of Greenville, S.C., assignors to Phillips Fibers Corporation, Greenville, S.C.

Filed Mar. 2, 1976, Ser. No. 663,005

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 PG **23 Claims**

1. A polyamide composition comprising (A) a polyamide, (B) an antistatic agent comprising the reaction product of (1) at least one tetrol compound of the formula:



where *a, b, c, d, e, f, g,* and *h* are each a whole number and the total of *a, b, c,* and *d* is between 8 and 1,000 and the total of *e, f, g,* and *h* is between 8 and 850 and B is an alkylene radical containing 1 to 13 carbon atoms, wherein the molecular weight of said tetrol compound is between about 1,650 and about 135,000 and said (OCH_2CH_2) moieties make up from about 10 to about 90 weight percent of said tetrol compound, and (2) at least one dicarboxylic acid ester having the formula R'OOC–

A-COOR′ wherein A is a valence bond or a divalent hydrocarbyl radical having from 1 to 8 carbon atoms and R′ is an alkyl group containing 1 to 4 carbon atoms or a hydroxyalkyl group containing 2 to 4 carbon atoms, wherein the two R′ radicals may be the same or different; and (C) a zinc dihydrocarbyldithiophosphinate in which the hydrocarbyl group is selected from acyclic alkyl radicals containing 4 to 10 carbon atoms and cycloaliphatic radicals containing from 4 to 10 carbon atoms; said zinc dihydrocarbyldithiophosphinate being present in said polyamide composition in such an amount that when said polyamide composition is dyed the K/S value is greater than that which would be observed if no zinc dihydrocarbyldithiophosphinate were present, and said antistatic agent being present in an amount sufficient to improve the antistatic characteristics of said polyamide.

4,069,278

PROCESS OF MAKING A HIGH MELT VISCOSITY BLOCK CO-POLYESTER

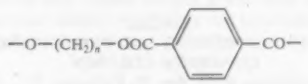
Willem Frederik Hendrik Borman, Evansville, Ind.; Donald Irving Craft, and Mortor Kramer, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 1, 1975, Ser. No. 564,128

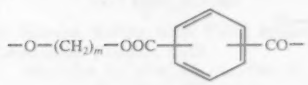
Int. Cl.[2] C08L *67/02*

U.S. Cl. 260—850 12 Claims

1. A method of preparing a high melt viscosity thermoplastic polyester blend of at least two different polyesters having repeating units of the formula:



or



wherein *n* and *m* are positive integers between 1 and 10; said method consisting essentially of melt blending at least two low to medium melt viscosity linear polyesters, wherein at least one of the low to medium viscosity linear polyesters is a branched co-polyester that includes from 0.01 to 5 mole percent based on the terephthalate units, of units of branching component which contains at least three ester-forming groups, and thereafter subjecting the melt blended polyesters to a temperature of 10°–50° C. below the melting point of the lowest melting ingredient in the blend until the melt viscosity has increased to at least 10,000 poises at a temperature of 10°–15° C. above the melting point of the blend.

4,069,279

DIALKYLPHENOL PHOSPHORYLATION

Julian William Boyden, Eastwood, England, assignor to Albright & Wilson Limited, Warley, England

Filed Mar. 21, 1973, Ser. No. 343,602

Claims priority, application United Kingdom, Mar. 23, 1972, 13668/72

Int. Cl.[2] C07F *9/12*

U.S. Cl. 260—975 24 Claims

1. A process of manufacturing triaryl phosphate mixtures which comprises:

1. reacting a phosphorylating agent selected from the group consisting of phosphorus oxychloride, phosphorus oxybromide, phosphorus pentoxide, phosphoric acid, phosphorus trichloride and phosphorus pentachloride, with a recycle composition of phenols, the total molar proportion of phenols to atoms of phosphorus in the phosphorylating agent being less than 3:1;
2. reacting the product of stage (1) with a feedstock composition of phenols said feedstock composition comprising phenol, at least one monoalkylphenol, and phenol selected from the group consisting of dialkylphenols and trialkylphenols and being the reaction product obtained by alkylating (i) phenol, or (ii) a mixture of phenols comprising a major molar portion of phenols having less than three alkyl carbon atoms, with (iii) a phenol alkylating agent containing from three to sixteen carbon atoms per molecule, the proportion of feedstock composition added at (2) being such that the molar ratio of the total of phenols fed into the process to phosphorus atoms is at least 3:1 to form a mixture of (a) triaryl phosphates and (b) unreacted phenols which is enriched in said phenol selected from the group consisting of dialkylphenols and trialkylphenols when compared to said feedstock composition;
3. recovering said unreacted phenols which is enriched in said phenol selected from the group consisting of dialkylphenols and trialkylphenols from the stage (2) product which is then said recycle composition of phenols; and
4. recycling said recycle composition to stage (1).

4,069,280

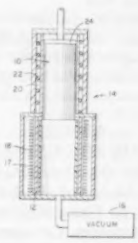
METHOD OF MAKING PLASTIC OPTICAL FIBERS

Raymond W. Kidder, c/o Kidco Incorporated, P.O. Box 278, Medford, N.J. 08055

Filed Oct. 20, 1972, Ser. No. 299,187

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 9 Claims



1. A method of making plastic optical fibers comprising the steps of pre-forming a rod-like core member of plastic, preforming a sheath member of plastic having a longitudinal internal passage shaped like but normally being smaller than the cross-section of said core member at room temperature, said core and sheath members being pre-formed to substantially the same length, said core member having an index of refraction greater than the index of refraction of said sheath member, placing said sheath member and said core member in a vacuum chamber of a Boule forming unit, operating heating units of said Poule forming unit to apply heat to said sheath member placed therein to raise and maintain the temperature of said sheath member above room temperature to enlarge the internal passage thereof such that said core member can be inserted into the internal passage of said sheath member, maintaining said core member at approximately room temperature in said Boule forming unit prior to insertion into said sheath member, thereafter inserting said core member into said internal passage of said sheath member, the internal passage of said sheath member being at said raised temperature at least slightly greater than and being at room temperature less than the external diameter of said core member at room temperature so that the sheath member will shrink onto said core member when said assembly is allowed to return to room temperature, allowing said assembled core member and sheath member to return toward room temperature in said vacuum chamber so that said sheath member will shrink tightly onto said core member homogeneously throughout the length thereof and form a Boule, and drawing said Boule to an increased length to form an optical fiber.

4,069,281

PREFABRICATED ROADWAY MARKING STRIP MATERIAL AND METHOD FOR PRODUCING SAME

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,447
Claims priority, application Italy, Sept. 30, 1974, 27881/74
Int. Cl.[2] B29D *11/00*
U.S. Cl. 264—1 **2 Claims**

1. A method of making a preformed roadway marking strip, comprising the steps of

providing a lower layer of base-forming material which is to be subsequently applied over a roadway surface;

applying a hardenable synthetic plastic material over said lower layer to form thereon an upper layer of such synthetic plastic material;

embedding anti-skid particles in said upper layer prior to hardening of said synthetic plastic material;

applying additional quantities of synthetic plastic material onto said upper layer at longitudinally spaced locations of the same and prior to hardening of the material thereof, so that each such additional quantity forms a protuberance on said upper layer; and

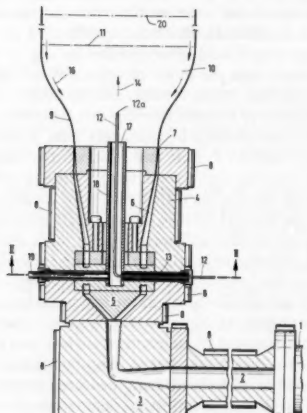
cascading light-reflective particles over said protuberances prior to hardening of the synthetic plastic material thereof, so that upon subsequent hardening said light-reflective particles adhere to said protuberances.

4,069,282

PROCESS FOR THE UNINTERRUPTED MANUFACTURE OF PLASTIC FILM TUBING

Hermann Gutermuth, Linz, and Gerd Hebel, Berlin, both of Germany, assignors to Firma Kohlensaeure-Werke Rudolf Buse Sohn, Bad Hoenningen, Germany

Filed Feb. 18, 1976, Ser. No. 658,924
Claims priority, application Germany, Feb. 19, 1975, 2507070
Int. Cl.[2] B29F *3/08*
U.S. Cl. 264—28 **3 Claims**



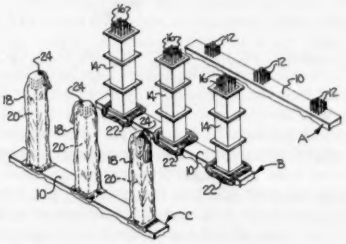
1. A process for the uninterrupted manufacture of plastic film tubing by the blowing up of a continuous film tubing formed by means of an extruder-injector having a nozzle tip and blowing head, including an inner cooling of the film tubing upon extrusion by the use of a gaseous cooling medium which is introduced in a substantially liquid form into an inner space of the film tubing where it is converted to its vaporous or gaseous state through heat absorption, before being discharged through a coolant outlet, characterized by introducing a cooling medium, selected from the group consisting of carbon dioxide, nitrogen, air and fluorized hydrocarbon halides, in its substantially liquid form inside the inner space of the film tubing in such a manner that it creates a coolant stream in a center of the inner space in one direction away from the nozzle tip and blowing head of the extruder until the stream reaches a reversing point, coolant particles in one of liquid or solid form being carried and held in suspension by said stream and the coolant stream fanning out substantially radially at the reversing point before changing into a sinking coolant stream in a falling direction opposite the one direction along the wall of the film tubing up to the coolant outlet of the blowing head; and causing the cooling medium while introducing it inside the inner space to reach the reversing point at such a distance from the nozzle tip and blowing head that the coolant particles in one of liquid or solid form can evaporate before the cooling medium reaches a section of the film tubing which lies below a frost line located within the tubing, whereby the section of the tubing only comes in contact with a sinking or falling vaporous and/or gaseous coolant stream.

4,069,283

METHOD OF CURING AND PROTECTING A CONCRETE COLUMN

Arthur A. Rauchfuss, P. O. Box 25, Patterson, N.C. 28661

Filed Apr. 5, 1976, Ser. No. 673,685
Int. Cl.[2] E04B *1/16*
U.S. Cl. 264—32 **5 Claims**



1. A method of efficiently curing and protecting a structural concrete column, beam, or the like and characterized by the short duration use of the form to thereby permit an overall reduction in the number of forms required at a particular construction site, and comprising the steps of

assembling a form to define the desired configuration of a columnar structural member at the intended permanent location of the structural member,

filling the assembled form with plastic concrete,

removing the form from the concrete upon the same becoming sufficiently rigid to be self-supporting but prior to the full curing thereof, and then

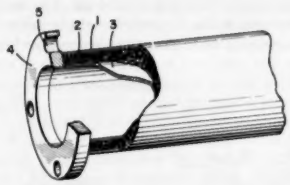
translating a continuous tubular length of sheet material coaxially along the self-supporting concrete so as to be disposed about the entire length thereof and maintaining the same in such position until the concrete is substantially fully cured, the sheet material thereby serving to substantially preclude moisture loss from the concrete while protecting the same from being stained by external substances.

4,069,284

ANTI-VIBRATION HEAT-INSULATION STRUCTURE AND A PROCESS FOR PRODUCTION THEREOF

Itaru Niimi, Nagoya; Yasuhisa Kaneko, Toyota; Fumiyoshi Noda, Toyota, and Yuji Watanabe, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 22, 1973, Ser. No. 325,415
Claims priority, application Japan, Jan. 20, 1972, 47-7861
Int. Cl.[2] B29H 7/20
U.S. Cl. 264—43 5 Claims



1. A process of manufacturing a vibration resistant heat insulator comprising,

coating foamable silicic acid mineral grains with a bonding agent,

charging said coated mineral grains into a space between two spaced walls,

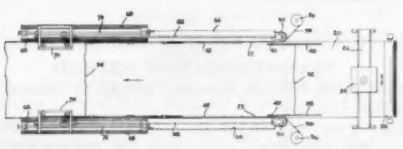
and heating said coated mineral grains until they are expanded and bonded together by said bonding agent which strengthens the expanded mineral grains.

4,069,285

METHOD AND APPARATUS FOR MAKING FLAT TOP BUNS

Charles W. Morgan, Rolling Hills, Calif., assignor to United Foam Corporation, Compton, Calif.

Filed Oct. 27, 1976, Ser. No. 736,142
Int. Cl.[2] B29D 7/02, 27/04
U.S. Cl. 264—51 36 Claims



1. In apparatus for obtaining molded products in continuous open molding equipment having a conveyor system defining an open top trough in which is disposed a main film member formed to have a bottom and two side regions to cover the bottom and at least part of the side walls defining the trough onto which foam reactants are dispensed to react in a foaming region to form a continuous bun as the main film member along the conveyor system, the improvement comprising:

supply means for supplying tubular film members, each having at least a tubular portion, adjacent each side of said trough adjacent the region said foam reactants are dispensed;

means for gathering each of said tubular film members adjacent a lower portion of said side regions of said main film member and the respective said side wall defining the trough;

guide means adjacent each side of said conveyor system, each of said guide means being a means for extending into a respective one of said tubular members and for guiding the top thereof along an upwardly inclined trajectory adjacent said foaming region; and

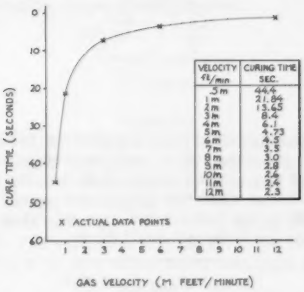
means for opening each of said tubular members adjacent the end of said foaming region to allow separation of said tubular members from said guide means.

4,069,286

METHOD OF THERMALLY CURING POLYMERIC MATERIALS

Milton Sharples Greenhalgh, Fairfield, CT, assignor to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 493,680, Aug. 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 310,636, Nov. 29, 1972, abandoned. This application Feb. 9, 1976, Ser. No. 656,448
Int. Cl.[2] B29C 25/00
U.S. Cl. 264—85 38 Claims



1. A method of accelerating the rate of effecting a cure in heat curable polymeric compositions by increasing the effectiveness of heat transfer from a gas heating medium to a heat curable polymeric compound, comprising contacting a surface of a body of heat curable polymeric composition with a stream of hot gas heated to a temperature of about 500° F to about 1000° F and flowing in contact over the surface of said body at a velocity of at least 3000 up to about 12,000 feet per minute while said gas is under a pressure of at least about 45 up to about 200 lbs. per square inch within the confines of an elongated curing chamber, and flowing said stream of heated gas moving under pressure at a velocity of at least 3000 up to about 12,000 feet per minute in direct contact over the surface of the body of heat curable polymeric composition for a dwell period sufficient to raise the body of heat curable polymeric composition substantially throughout its mass to its curing temperature and thereby effecting a substantial cure of the polymeric composition.

4,069,287

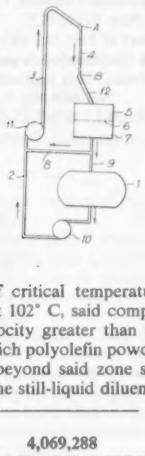
PROCESS FOR THE PRODUCTION OF POLYOLEFIN FIBERS

Joseph Aboulafia; Richard Le Fustec, both of Le Havre, and Claude Schranz, Harfleur, all of France, assignors to Compagnie Francaise de Raffinage and Groupement Europeen de la Cellulose, Paris, France

Continuation-in-part of Ser. No. 545,830, Jan. 21, 1975, abandoned. This application July 23, 1976, Ser. No. 708,067
Claims priority, application France, July 25, 1975, 75 23297; Jan. 31, 1974, 74.3388
Int. Cl.[2] D21F 11/00
U.S. Cl. 264—140 17 Claims

1. A process for manufacturing polyethylene or polypropylene fibers from a composition of said polyolefin dissolved in a diluent, which is cyclohexane, hexane, pentane, heptane, or mixtures thereof, at a concentration of about 1 to about 5% by weight, which fibers generally have a length of between 0.1 mm and 2 cm and a diameter of bundles of such fibers of between 5 μ and 200 μ, comprising flowing said composition through at least one elongated zone circumscribed by a stationery boundary having a length of about 40 cm to about 10 m and a diameter of about 1.5 mm to about 4 mm, said composition being brought down to a temperature range such that

while in said zone said range is below the temperature of solution of said polyolefin in the molten state and within, but not below, the range of critical temperatures in which said polyolefin would remain dissolved under the given conditions and with the composition at rest but precipitates when subjected to shear; whereby polyolefin fibers are formed in said



diluent, said range of critical temperatures being between about 78° C and about 102° C, said composition in said zone being flowed at a velocity greater than the velocity for the given conditions at which polyolefin powder would be formed with said fibers, and beyond said zone separating the fibers from a suspension in the still-liquid diluent.

4,069,288

METHOD FOR PREPARING FIRE RETARDANT MOLDING COMPOSITIONS

Raymond A. Barkhuff, Jr., Hampden, and William E. Sprenkle, Jr., Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 26, 1976, Ser. No. 679,943
Int. Cl.[2] C08K *5/59*
U.S. Cl. 264—141 **9 Claims**

1. An improved process for compounding fire retardant polystyrene compositions, which comprise a polystyrene component, a metal oxide and a fire retardant halogen additive which method comprises:

A. mixing the metal oxide with a minor amount of the polystyrene component;

B. subjecting the mixture to high intensity mixing at or above the fusion temperature of the polystyrene for a time sufficient to uniformly disperse the metal oxide in the molten polystyrene;

C. comminuting the polystyrene-metal oxide mixture obtained in Step B above;

D. blending the comminuted polystyrene-metal oxide mixture with the other ingredients of the composition;

E. compounding the blend from (D) above at temperatures above 255° C. and below the temperature at which degradation occurs; and

F. comminuting the compounded blend.

4,069,289

METHOD OF FORMING ELEMENTS OF INSULATING MATERIAL ON A BIMETAL STRIP

Fritz Krasser, and William F. Sell, both of Altdorf, Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Germany

Filed Apr. 13, 1976, Ser. No. 676,516
Claims priority, application Germany, May 20, 1975, 2520884
Int. Cl.[2] B29C *6/04*
U.S. Cl. 264—157 **5 Claims**

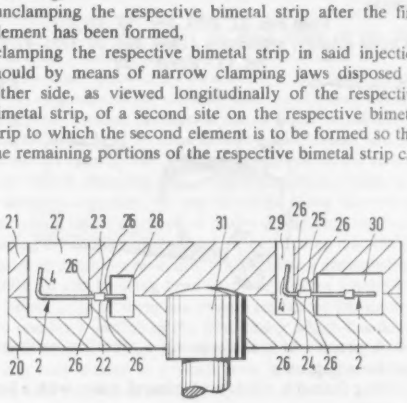
1. A method of forming, by injection moulding, first and second elements of insulating material on each of at least two bimetal strips, with the second element being spaced from the first element, comprising the steps of

a. clamping a respective bimetal strip in an injection mould by means of narrow clamping jaws disposed at either side, as viewed longitudinally of the respective bimetal strip, of a first site on the respective bimetal strip to which the first element is to be formed, so that remaining portions of the respective bimetal strip can bow freely in response to heating of said injection mould,

b. forming the first element on said first site by injection moulding,

c. unclamping the respective bimetal strip after the first element has been formed,

d. clamping the respective bimetal strip in said injection mould by means of narrow clamping jaws disposed at either side, as viewed longitudinally of the respective bimetal strip, of a second site on the respective bimetal strip to which the second element is to be formed so that the remaining portions of the respective bimetal strip can



freely bow in response to heating of said injection mould, and

e. forming the second element on said second site by injection moulding,

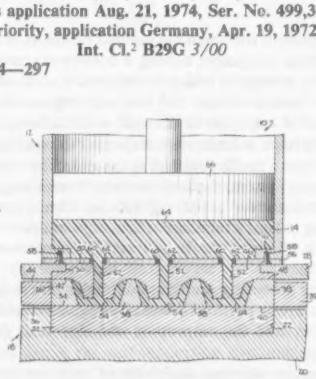
f. said steps (a) through (e) being carried out such that said bimetal strips are clamped in said injection mould with one of said bimetal strips being clamped in a region of said first site and the other of said bimetal strips being clamped in a region of said second site, that after said elements have been injection moulded on said two bimetal strips at their respective sites, said two bimetal strips are mutually exchanged and clamped on either side of said second site and said first site, respectively, and that thereafter the two further elements are produced by a further injection moulding operation.

4,069,290

TRANSFER MOLDING METHOD

Lambert Pasch, Nutheim, Germany, assignor to Uniroyal A.G., Aachen, Germany

Division of Ser. No. 316,164, Dec. 18, 1972, Pat. No. 3,859,023.
This application Aug. 21, 1974, Ser. No. 499,369
Claims priority, application Germany, Apr. 19, 1972, 2219055
Int. Cl.[2] B29G *3/00*
U.S. Cl. 264—297 **4 Claims**



1. A method of molding elastomeric stock, said method comprising: interposing a multi-apertured, heat-resistant, flexible, insulation plate between a heated mold and an elastomeric stock injection unit, said mold having mold cavities aligned

with corresponding ones of said apertures of said insulation plate, said elastomeric stock injection unit including an open ended chamber in which pressure can be exerted against a quantity of elastomeric stock therein at least sufficient to fill said mold cavities, one side surface of said insulation plate confronting said open ended chamber, the other side surface of said insulation plate confronting and forming a parting line with said mold; supporting said insulation plate for movement at least slightly axially into said chamber of said injection unit; moving said mold and said injection unit relative to one another such that engagement by said mold with said insulation plate effects movement of the latter inwardly of said chamber and, thereby, an expulsion of a portion of said elastomeric stock under substantially uniform fluid pressure from said chamber concurrently through each of said apertures in said insulation plate and into said mold cavities; and curing the transferred portion of elastomeric stock in said mold cavities, without separating said mold or said injection unit from said insulation plate or relaxing said fluid pressure, said insulation plate serving to thermally insulate the remaining portion of elastomeric stock in said chamber from said heated mold in order to prevent the curing of said remaining portion of stock with the curing of said transferred portion of stock.

4,069,291

DENSIFICATION OF PARTICULATE POROUS FLUORINATED RESINS

Kunizoh Kidoh; Hideki Wakamori; Genzo Asai, and Kazuo Kusida, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed June 18, 1976, Ser. No. 697,735
Claims priority, application Japan, June 20, 1975, 50-74403
Int. Cl.[2] B29C *27/00*
U.S. Cl. 264—342 R 8 Claims

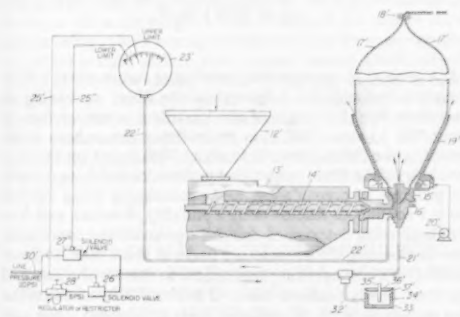
1. A process for increasing the bulk density of a porous particulate fluorinated resin, which comprises preparing a suspension of a particulate porous fluorinated resin in an aqueous medium containing, as a suspension stabilizer, a powder of an inorganic material which is insoluble or slightly soluble in water, and heating the suspension at approximately the melting temperature of the resin, thereby reducing the volume of the particulate fluorinated resin.

4,069,292

PRESSURE CONTROL IN TUBULAR THERMOPLASTIC EXTRUSION

F. John Herrington, Holcomb, and Gordon P. Hungerford, Palmyra, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 501,118, Aug. 28, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,235
Int. Cl.[2] B29D *7/22, 23/04*
U.S. Cl. 264—40.3 1 Claim



1. A method for controlling internal air pressure within a tubular thermoplastic film bubble which comprises initially inflating said bubble with air under pressure until a desired internal pressure is achieved, continuously sensing and monitoring said internal pressure by means of a pressure sensor device in communication with the interior of said bubble, said pressure sensor device continuously sending a signal to a pressure control device, and when said pressure falls below a preselected level actuating an air pressure input valve, said valve being in communication with said control device, a source of air under pressure and the interior of said bubble, whereby makeup air pressure is added to said bubble, and when said air pressure within said bubble is above a preselected level, said air pressure is immediately reduced through an exhaust valve in direct communication with said bubble, said exhaust valve being pressure-actuated; and said exhaust valve being responsive to small incremental pressure variations as well as sudden surges of high pressure.

4,069,293

METHOD FOR DISSOLVING PLUTONIUM DIOXIDE

Othar K. Tallent, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 574,977, May 6, 1975, Pat. No. 3,976,775. This application Feb. 20, 1976, Ser. No. 659,826
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.[2] C01G *56/00*
U.S. Cl. 423—3 3 Claims

1. In a method for dissolving PuO_2 in an aqueous dissolving mixture comprising PuO_2, HNO_3 and an effective catalytic amount of fluoride, the improvement comprising providing oxidizing conditions in said dissolving mixture to oxidize dissolved Pu ions and thereby increase the rate of PuO_2 dissolution.

2. The method of claim 1 wherein said oxidizing conditions are provided electrolytically.

4,069,294

HYDROMETALLURGICAL RECOVERY OF METAL VALUES

Laurence G. Stevens, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 21, 1976, Ser. No. 679,106
Int. Cl.[2] C01G *3/14, 45/00, 51/12, 53/12*
U.S. Cl. 423—32 6 Claims

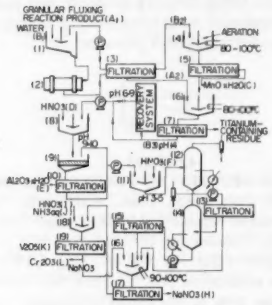
1. A process for the recovery of metal values from a metal bearing source containing a metal selected from the group consisting of nickel, cobalt, copper and manganese, which comprises the steps of:

1. pretreating a minor portion of said metal bearing source with a hydrogen halide treated tail stream formed as hereinafter set forth and then commingling the pretreated minor portion with the remainder of the metal bearing source;
2. roasting the resultant mixture in a reducing atmosphere at a temperature of from about 550° to about 900° C.;
3. cooling the roasted material and then extracting the same with an ammonium carbonate leaching solution;
4. scrubbing the hydrogen halide-containing offgas from roasting step (2) with a slurry of at least a portion of the leached tails from step (3) to transfer hydrogen halide from the offgas to the slurry; and
5. supplying resultant hydrogen halide-containing slurry from step (4) to step (1) as said hydrogen halide treated tail stream.

4,069,295
TREATING RAW MATERIALS CONTAINING TITANIUM COMPONENTS

Yujiro Sugahara, Tokyo; Yoshibumi Noshi, Tsuruoka; Hiroyuki Naito, Tsuruoka; Kiyoshi Takai, Tsuruoka, and Noboru Maruyama, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 30, 1976, Ser. No. 682,058
Claims priority, application Japan, May 1, 1975, 50-52071; Apr. 8, 1976, 51-38752
Int. Cl.[2] C01G 45/00, 37/14, 31/00, 23/08
U.S. Cl. 423—49 9 Claims



1. In a method of treating a titanium containing raw material selected from the group consisting of ilmenite, sand iron slag and high titanium slag by heat-treating the raw material in the presence of a flux composed mainly of an alkali metal nitrate or a thermal decomposition product thereof in an amount 2 to 5 times by weight of the amount of raw material in a non-reducing atmosphere to thereby effect a fluxing reaction, and subjecting the resulting fluxing reaction product to a leaching treatment of at least one stage in an aqueous medium to separate the fluxing reaction product into a leaching solution containing at least one metal component selected from the group consisting of Mn, V and Cr and a leaching residue composed of a concentrate of titanium component which is acid-soluble and substantially free of the metal component, the improvement which comprises incorporating said leaching residue in an amount at least 1.2 times by weight the amount of said raw material into the mixture of said raw material and said flux, shaping the resulting composition into granules, and heat-treating said granules at a temperature of 750° to 950° C for a time within the range of 3 minutes to 2 hours thereby keeping said granules in the substantially non-sticky state throughout the heat treatment.

4,069,296
PROCESS FOR THE EXTRACTION OF ALUMINUM FROM ALUMINUM ORES

Wen H. Huang, Texas A & M University, College Station, Tex. 77843

Filed Oct. 8, 1976, Ser. No. 731,025
Int. Cl.[2] C01F 7/22
U.S. Cl. 423—127 11 Claims

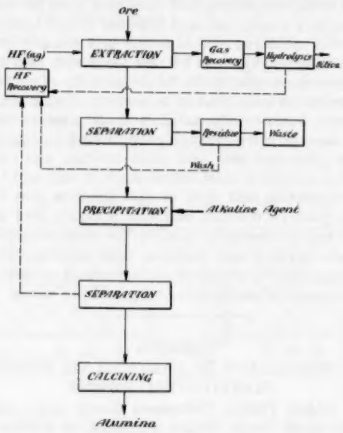
1. A process for the extraction and recovery of aluminum values from an aluminum ore comprising:

a. treating said aluminum ore with a aqueous solution of hydrofluoric acid, said aqueous solution of hydrofluoric acid containing not less than about 2 weight percent of HF;

b. adjusting the temperature of said solution to a value not greater than about 100° C to form an aqueous solution containing a dissolved aluminum ion complex and an insoluble residue;

c. removing said insoluble residue from said aqueous solution containing dissolved aluminum ion complex;

d. increasing the pH of said aqueous solution to a valve of not greater than that at which hydrated aluminum hydroxide precipitates by the addition of an alkaline reagent and removing any non-aluminum hydroxide precipitates;



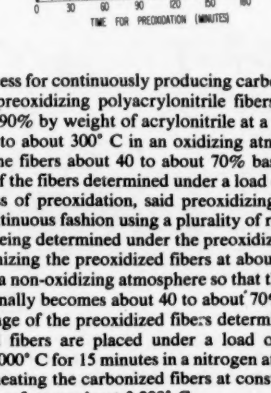
e. mixing said aqueous solution containing dissolved aluminum ion complex with sufficient additional alkaline reagent to precipitate substantially all said aluminum values as hydrated aluminum hydroxide; and

f. recovering said hydrated aluminum hydroxide from said aqueous solution.

4,069,297
PROCESS FOR PRODUCING CARBON FIBERS

Kazuhisa Saito, and Hiroyasu Ogawa, both of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,244
Claims priority, application Japan, Apr. 8, 1975, 50-42444
Int. Cl.[2] D01F 9/12
U.S. Cl. 423—447.6 20 Claims



1. A process for continuously producing carbon fibers which comprises preoxidizing polyacrylonitrile fibers containing at least about 90% by weight of acrylonitrile at a temperature of about 200° to about 300° C in an oxidizing atmosphere while shrinking the fibers about 40 to about 70% based on the free shrinkage of the fibers determined under a load of 1 mg/d with the progress of preoxidation, said preoxidizing being carried out in a continuous fashion using a plurality of rollers, said free shrinkage being determined under the preoxidizing conditions; then carbonizing the preoxidized fibers at about 500° to about 1,000° C in a non-oxidizing atmosphere so that the shrinkage of the fibers finally becomes about 40 to about 70% based on the free shrinkage of the preoxidized fibers determined when said preoxidized fibers are placed under a load of 1 mg/d and heated at 1,000° C for 15 minutes in a nitrogen atmosphere; and thereafter heating the carbonized fibers at constant length at a temperature of up to about 3,000° C.

4,069,298

CARBON BLACK PRODUCING METHOD

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 12, 1976, Ser. No. 704,588
Int. Cl.[2] C01B *31/02;* C09C *1/48*
U.S. Cl. 423—456 7 Claims

1. A process of quenching a carbon black manufacturing furnace process, in which a free oxygen-containing gas and a carbon black make hydrocarbon are subjected to partial combustion and pyrolysis in a reaction zone to produce a hot smoke containing carbon black particles, which flows in a vortex path along the reaction zone, comprising solid carbon black particles suspended in off-gas, said process including the steps of:

a. introducing a quench fluid, which is cooler than the hot smoke in the reaction zone, into the reaction zone in a generally tangential direction for initial vortex flow in a direction counterrotational to the direction of vortex flow of the hot smoke.

4,069,299

HYDROXY-ALUMINUM CHLORIDE AND SULFATE POLYMER PRODUCTION

Clive Hodgson, Forest Knolls, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 683,551, May 5, 1976, abandoned. This application Dec. 6, 1976, Ser. No. 747,566
Int. Cl.[2] C01F *7/00, 7/74, 7/56*
U.S. Cl. 423—462 17 Claims

1. A process of preparing hydroxy-aluminum chloride or sulfate which comprises reacting urea and aluminum chloride or aluminum sulfate, wherein the molar ratio of aluminum chloride to urea varies from about 1:0.1 to 1:1.3 and the molar ratio of aluminum sulfate to urea varies from about 1:0.1 to 1:2.6, at a temperature of about 50° to 150° C, in aqueous solution medium of about 1 mol to 1000 mols water per mol of urea.

4,069,300

PROCESS FOR PRODUCING α-TYPE CALCIUM SULFATE HEMIHYDRATE

Hakuichi Akazawa, and Kenichi Nishimura, both of Kakogawa, Japan, assignors to Taki Chemical Co., Ltd., Kakogawa, Japan

Filed Sept. 24, 1975, Ser. No. 616,312
Claims priority, application Japan, Oct. 3, 1974, 49-115006
Int. Cl.[2] C01F *11/46;* C04B *11/02*
U.S. Cl. 423—555 5 Claims

1. A process for producing α-type hemihydrate of calcium sulfate by oxidizing calcium sulfite with air or oxygen at a temperature in the range of from 90° C to 130° C in a suspension containing surface active agents, the suspension containing seed crystals of α-type hemihydrate of calcium sulfate and having a pH in the range of from 3 to 6 and the surface active agents being at least one agent selected from the group consisting of (a) anionic surface active agents having a sulfonic acid group as the hydrophilic atomic group and having an alkyl, alkyl-aryl or alkylallyl group as the hydrophobic atomic group; (b) non-ionic surface active agents having a polyoxyethylene chain as the hydrophilic atomic group and having an alkyl or alkylphenoxy group as the hydrophobic atomic group and (c) amphoteric surface active agents of a betaine.

4,069,301

METHOD OF MAKING TITANIUM DISULFIDE

Arthur H. Thompson, New Providence, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 17, 1975, Ser. No. 641,425
Int. Cl.[2] C01G *23/00;* C01B *17/00*
U.S. Cl. 423—565 6 Claims

1. A process for producing titanium disulfide by reacting metallic titanium with elemental sulfur at elevated temperatures which comprises: charging a reaction vessel solely with metallic titanium and elemental sulfur; said sulfur being charged in an amount sufficient to satisfy the stoichiometry of the reaction between metallic titanium and elemental sulfur to form titanium disulfide, to provide a sulfur pressure at least equal to the vapor pressure of elemental sulfur at a reaction temperature between about 630° C and 1040° C and to insure the presence of molten elemental sulfur; maintaining the metallic titanium in contact with the elemental sulfur at a reaction temperature of between 630° C and 1040° C whereby titanium disulfide is produced; and, after the reaction between elemental sulfur and metallic titanium is complete, cooling the products of reaction rapidly from at least 630° C to below 100° C such that formation of titanium trisulfide is minimized.

4,069,302

PURIFICATION OF SULFUR

Morton Meadow, Trenton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 30, 1976, Ser. No. 718,952
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—575 7 Claims

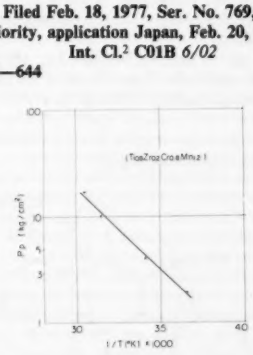
1. The method of removing carbonaceous materials from sulfur produced by the reaction of hydrogen sulfide and sulfur dioxide in the presence of an organic solvent solution of an alkali metal or alkaline earth metal salt of a carboxylic acid at a temperature between about 120° and about 140° C. whereby the sulfur is in liquid state which comprises separating the liquid sulfur from the organic solvent solution, thereafter contracting the sulfur in liquid state with water at a temperature of between about 120° C. and about 140° C. under pressure for a period sufficient so as to reduce the carbonaceous material content of the sulfur to not more than about 0.007% carbon by weight and recovering the sulfur.

4,069,303

ALLOY USEFUL AS HYDROGEN STORAGE MATERIAL

Tokio Yamadaya, and Yasuhiko Machida, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Japan

Filed Feb. 18, 1977, Ser. No. 769,952
Claims priority, application Japan, Feb. 20, 1976, 51-18125
Int. Cl.[2] C01B *6/02*
U.S. Cl. 423—644 4 Claims



4. A complex metal hydride useful as a hydrogen reservoir formed by reaction of hydrogen gas with a quaternary alloy represented by the general formula

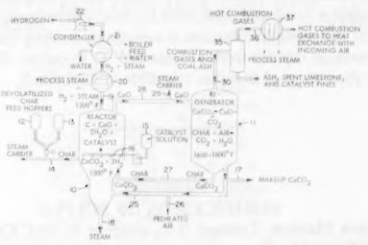
$$Ti_{x-y}Zr_yCr_{2-z}Mn_z$$

where $1 \leqq x \leqq 1.3$, $0 < y \leqq 1$, and $0 < z < 2$.

4,069,304
HYDROGEN PRODUCTION BY CATALYTIC COAL GASIFICATION

John A. Starkovich, Redondo Beach, and Jack L. Blumenthal, Los Angeles, both of Calif., assignors to TRW, Redondo Beach, Calif.

Filed Dec. 31, 1975, Ser. No. 645,858
Int. Cl.[2] C01B *1/02;* C01J *3/00*
U.S. Cl. 423—648 R 12 Claims



1. A process for producing hydrogen comprising the steps of:

a. reacting steam, carbonaceous material and lime with a catalyst to produce hydrogen, residual carbon and $CaCO_3$, the catalyst being selected from the group consisting of (1) NaF and (2) a salt of a Group I metal stabilized with a fluoride of a Group II metal;

b. regenerating $CaCO_3$ to lime, converting the residual char to combustion products;

c. reusing the catalyst and regenerated lime for further reaction with steam and carbonaceous material to produce additional hydrogen, and

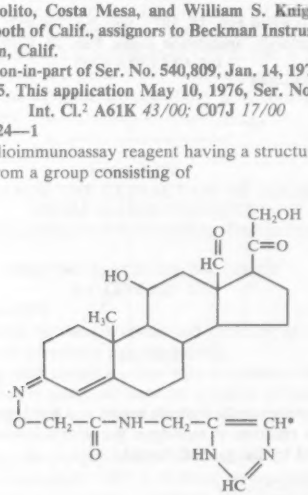
d. drawing off product, including hydrogen.

4,069,305
I^{125} IMIDAZOLE STEROID DERIVATIVES

Alan J. Polito, Costa Mesa, and William S. Knight, Laguna Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 540,809, Jan. 14, 1975, Pat. No. 4,021,535. This application May 10, 1976, Ser. No. 684,688
Int. Cl.[2] A61K *43/00;* C07J *17/00*
U.S. Cl. 424—1 10 Claims

1. A radioimmunoassay reagent having a structural formula selected from a group consisting of



and

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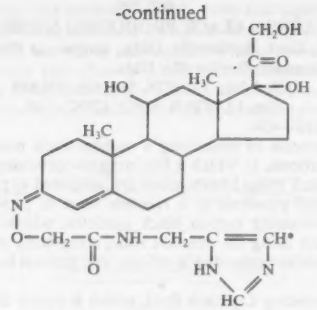


wherein the asterisk (*)indicates radioactive labelling.

4,069,306
X-RAY CONTRAST PREPARATION CONTAINING A HYDROPHILIC POLYMER CONTAINING AMINO GROUPS

Ulf Sven Erik Rothman, Bjarred, Sweden, assignor to Pharmacia Aktiebolag, Uppsala, Sweden

Continuation of Ser. No. 555,221, March 4, 1975, abandoned. This application May 21, 1976, Ser. No. 688,820
Claims priority, application Sweden, Mar. 14, 1974, 7403402
Int. Cl.[2] A61K *29/02*
U.S. Cl. 424—4 8 Claims

1. An X-ray contrast preparation intended for the X-ray examination of the gastro-intestinal tract, comprising minute particles of a cross-linked hydrophilic polymer containing amino groups suspended in a physiologically acceptable aqueous liquid and finely divided barium sulphate, said polymer being insoluble in water at body temperature and being a polyfunctional amine / or a member selected from the group consisting of dextran, cellulose, starch and pollulan which is substituted with amino groups and optionally with other ionizable groups which give rise to negative surface charges, said polymer having molecules held together to a water-insoluble, but waterswellable three-dimensional network by bridges comprising straight or branched aliphatic saturated hydrocarbon chains substituted by one or more hydroxyl groups and containing 3 - 30 carbon atoms and being non-broken or broken by one or more oxygen atoms and said polymer containing more than 0.1 and less than 15 milliequivalents of amino groups per gram of dry polymer, the swellability of the polymer particles in water being such that one gram of polymer in the presence of water is able to absorb more than 0.5 g and less than 50 g of water, the average particle size of the polymer particles in the presence of water being greater than 0.1 micrometer and smaller than 300 micrometer, and the ratio between the polymer particles and the barium sulphate being 2 to 100 g of said particles per 100 g of barium sulphate.

4,069,307
DRUG-DELIVERY DEVICE COMPRISING CERTAIN POLYMERIC MATERIALS FOR CONTROLLED RELEASE OF DRUG

Takeru Higuchi, and Anwar Hussain, both of Lawrence, Kans., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 281,446, Aug. 17, 1972, Pat. No. 3,903,880, which is a continuation-in-part of Ser. No. 80,531, Oct. 14, 1970, abandoned. This application May 30, 1975, Ser. No. 582,353
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.[2] A61K *9/26*
U.S. Cl. 424—22 9 Claims

1. A shape retaining implant for releasing drug formed of a copolymer compatible with body tissue, the improvement wherein the implant is formed of a matrix of ethylene-vinyl acetate copolymer containing drug, said drug mixed through-

out the copolymer which has a vinyl acetate content of 4 to 80% by weight, a melt index of about 0.1 to 1000 grams per ten minutes, is permeable to the passage of the drug by diffusion, and capable of releasing a therapeutically effective amount of drug to body tissue at a predetermined and controlled rate over a prolonged period of time.

4,069,308

PROCESS AND APPARATUS FOR FORMING AEROSOLS OF PESTICIDAL CHEMICALS

Seizo Tanaka, Kanagawa, Japan, assignor to Showa Denko Kabushiki Kaisha and Sanko Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 398,739, Sept. 19, 1973, abandoned, which is a continuation of Ser. No. 148,045, May 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 707,515, Feb. 23, 1968, abandoned. This application Nov. 11, 1975, Ser. No. 630,830

Int. Cl.[2] A01N *17/02*

U.S. Cl. 424—43 10 Claims

1. A process for applying an insecticidal or fungicidal chemical to living plants in an enclosed area which comprises:

1. passing superheated steam having a temperature of from 110° C. – 800° C., through a vaporizable solid state insecticidal or fungicidal chemical thereby to evaporate said chemical, said superheated steam being the means employed to heat said chemical;
2. subsequently rapidly releasing the resulting entrained vapor into the air to rapidly cool said vapor and to form an aerosol of the insecticidal or fungicidal chemical in the vicinity of said living plants, and
3. then contacting said living plants with an insecticial or fungicidal amount of said chemical in the form of said aerosol.

4,069,309

CATIONIC SKIN SUBSTANTIVE SUNSCREEN COMPOSITION AND METHOD

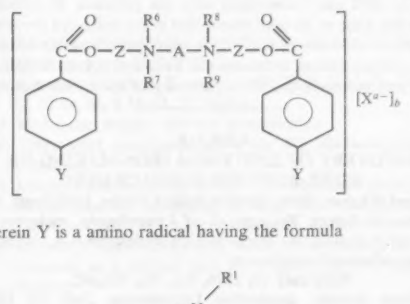
Joseph P. Ciaudelli, Ramsey, and Gerhart Karg, Pompton Lakes, both of N.J., assignors to Avon Products, Inc., Suffern, N.Y.

Filed Sept. 19, 1972, Ser. No. 290,327

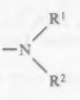
Int. Cl.[2] A61K *31/42;* C07C *101/00*

U.S. Cl. 424—47 7 Claims

1. A method of protecting human skin from erythema producing ultraviolet radiation which comprises applying to said skin a composition of a cosmetic carrier containing from about 1-10 percent by weight based on the total weight of the composition of a cationic aminobenzoate having the general formula:



wherein Y is a amino radical having the formula



such that R^1 and R^2 are each selected from the group consisting of C_1–C_5 alkyl, aryl, alkaryl, substituted alkyl, substituted aryl, and substituted alkaryl; wherein Z is a bivalent alkyl hydrocarbon containing from 1 to 5 carbon atoms; wherein X is an anion selected from the group consisting of chloro, bromo, fluoro, iodo, sulfate, bisulfate, carbonate, bicarbonate, sulfite, and bisulfite; wherein R^6, R^7, R^8 and R^9 are selected from the group consisting of alkyl, aryl, and alkaryl; wherein A is a bivalent C_1–C_{20} hydrocarbon bridging radical and wherein *a* and *b* are the integers 1 or 2.

4,069,310

METHOD FOR THE MANUFACTURE OF CLEAR DENTIFRICES

Michael Harrison, Ravenshead, England, assignor to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 403,985, Oct. 5, 1973, abandoned, which is a division of Ser. No. 197,499, Nov. 10, 1971, abandoned. This application Dec. 12, 1975, Ser. No. 640,123

Claims priority, application United Kingdom, Nov. 27, 1970, 56575/70

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 6 Claims

1. A method for the manufacture of a visually clear, bubble-free dentifrice comprising a vacuum deareated synthetic inorganic complex silicate clay gelling agent of the formula

$$[Si_8Mg_{5.1}Li_{0.6}H_{7.6}O_{24}]^{0.6-}Na^{+}_{0.6},$$

a dentally acceptable substantially water-insoluble polishing agent having a refractive index of about 1.44 to 1.48, water, sorbitol and glycerine, with the proportion of such dentifrice components being about 1 to 5% of such gelling agent, about 5 to 50% of such polishing agent, about 5 to 30% of water, about 20 to 75% of sorbitol and at least 5% of glycerine, with the total of water, sorbitol and glycerine being about 30 to 94%, which comprises high shear mixing said deaerated gelling agent, heated to about 90° C. for about 15 minutes, 40° C. for one hour or unheated at room temperature for 16 hours, with water and sorbitol to produce a clear gel and admixing glycerine with the clear gel to make a clear water-sorbitol-glycerine gel.

4,069,311

ORAL DENTIFRICE CONTAINING UNIFORM PARTICLES OF SPECKLING MATERIAL

Giuseppe Mannara, Rome, Italy, assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 529,665, Nov. 4, 1974, Pat. No. 4,003,971. This application Oct. 20, 1976, Ser. No. 734,052

Int. Cl.[2] A61K *7/18, 7/22, 7/28, 7/26*

U.S. Cl. 424—49 8 Claims

1. A powder or extrudible oral dentifrice which contains about 0.1 to 50% by weight of dentifrice speckles of substantially uniform spherical shape and size prepared by the process which comprises:

A. agitating a heated mixture of a speckling material and a dispersing liquid for said speckling material, said speckling material containing a dentifrice component and a binder for such component, at a temperature at which the binder is liquid, to produce a homogeneous dispersion in the dispersing liquid of individual droplets of said speckling material of sizes in the range of about 0.05 to 1 mm. effective diameter; said mixture being of about

I. 1 to 40% by weight of such speckling material, which is

a. about 75 to 99.9% by weight of a normally solid water insoluble organic dentifrice binder selected from the group consisting of thermoplastic resins, gums, gels, paraffins, waxes, polymers, higher fatty acids, higher fatty acid salts, lower alkylene glycol diesters, glyceryl diesters and glyceryl triesters; and

b. about 0.01 to 25% by weight of a dentifrice component selected from the group consisting of fluorine-containing anti-caries agents, polishing agents, antimicrobial agents, ammoniating agents, vitamins, de-

sensitizing agents, enzymes, optical brighteners, astringents, preservatives, flavoring agents and colorants; and

II. about 60 to 99% by weight of a dispersing liquid which has a normal boiling point which is at least 10° C above the solidification point of said binder and below the normal boiling point of said binder and which has a solidification point at least 20° C below the solidification point of the binder, in which dispersing liquid the binder is substantially insoluble, said dispersing liquid being selected from the group consisting of water and aqueous solutions of lower polyhydric alcohols of 2 to 6 carbon atoms; and

B. cooling such mixture of speckling material and dispersing liquid, while continuing agitation thereof, to a temperature below the solidification point of said binder, at which temperature the dispersing liquid remains liquid, to obtain solid dentifrice speckles of the binder and dentifrice component in the dispersing liquid, having substantially uniform spherical shape and sizes in the range of about 0.05 to 1 mm. effective diameter, homogeneously dispersed in said dispersing liquid.

4,069,312

UNIFORM PARTICLES OF SPECKLING MATERIAL FOR INCORPORATION IN ORAL DENTRIFICES

Giuseppe Mannara, Rome, Italy, assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 520,665, Nov. 4, 1974, Pat. No. 4,003,971. This application Oct. 20, 1976, Ser. No. 734,053

Int. Cl.² A61K *7/18, 7/22, 7/28, 7/26*

U.S. Cl. 424—49 **5 Claims**

1. Dentifrice speckles of substantially uniform spherical shape and size prepared by the process which comprises:

A. agitating a heated mixture of a speckling material and a dispersing liquid for said speckling material, said speckling material containing a dentifrice component and a binder for such component, at a temperature at which the binder is liquid, to produce a homogeneous dispersion in the dispersing liquid of individual droplets of said speckling material of sizes in the range of about 0.05 to 1 mm. effective diameter; said mixture being of about

I. 1 to 40% by weight of such speckling material, which is

a. about 75 to 99.9% by weight of a normally solid water insoluble organic dentifrice binder selected from the group consisting of thermoplastic resins, gums, gels, paraffins, waxes, polymers, higher fatty acids, higher fatty acid salts, lower alkylene glycol diesters, glyceryl diesters and glyceryl triesters; and

b. about 0.01 to 25% by weight of a dentifrice component selected from the group consisting of fluorine-containing anti-caries agents, polishing agents, antimicrobial agents, ammoniating agents, vitamins, desensitizing agents, enzymes, optical brighteners, astringents, preservatives, flavoring agents and colorants; and

II. about 60 to 99% by weight of a dispersing liquid which has a normal boiling point which is at least 10° C above the solidification point of said binder and below the normal boiling point of said binder and which has a solidification point at least 20° C below the solidification point of the binder, in which dispersing liquid the binder is substantially insoluble, said dispersing liquid being selected from the group consisting of water and aqueous solutions of lower polyhydric alcohols of 2 to 5 carbon atoms; and

B. cooling such mixture of speckling material and dispersing liquid, while continuing agitation thereof, to a temperature below the solidification point of said binder, at which temperature the dispersing liquid remains liquid, to obtain solid dentifrice speckles of the binder and dentifrice component in the dispersing liquid, having substantially uniform spherical shape and sizes in the range of about 0.05 to 1 mm. effective diameter, homogeneous dispersed in said dispersing liquid.

4,069,313

WATER-IN-OIL ADJUVANT COMPOSITION

Allen F. Woodhour, Horsham, and Maurice R. Hilleman, Lafayette Hill, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 525,149, Nov. 19, 1974, Pat. No. 3,983,228, which is a continuation-in-part of Ser. No. 392,402, Aug. 28, 1973, abandoned, which is a continuation of Ser. No. 233,815, March 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 141,401, May 7, 1971, abandoned. This application Apr. 7, 1976, Ser. No. 674,360

Int. Cl.² A61K *39/18, 39/12, 47/00*

U.S. Cl. 424—89 **11 Claims**

1. An adjuvant composition comprising a physiologically acceptable injectable oil and from about 0.5% to about 10% by volume of a stabilizer consisting essentially of aluminum monostearate, the aluminum monostearate being essentially free of any other fatty acid radical.

5. An adjuvant vaccine composition comprising a physiologically acceptable injectable oil, an antigen and from about 0.5 to 10% by volume of stabilizer consisting essentially of aluminum monostearate, the aluminum monostearate being essentially free of any other fatty acid radical.

4,069,314

GLYCOPEPTIDE EXTRACT

Christopher Adlam, 4A Starts Hill Road, Farnborough, Kent, and David Eric Reid, 90 Queensway, West Wickham, Kent, both of England

Continuation-in-part of Ser. No. 445,309, Feb. 22, 1974, Pat. No. 4,010,257. This application June 19, 1975, Ser. No. 588,313

Claims priority, application United Kingdom, Feb. 23, 1973, 9149/73; Feb. 14, 1974, 6759/74; Aug. 20, 1974, 36522/74

Int. Cl.² A61K *39/02, 35/78*

U.S. Cl. 424—92 **11 Claims**

1. An immunostimulating glycopeptide suitable for use in conferring on mammals or birds a resistance to Sarcoma 180T/G tumour and pathogenic microoganisms which glycopeptide is obtainable from the cell wall of an immunostimulating bacterium belonging to the Actinomycetaceae family of Prevot's classification, which glycopeptide is substantially insoluble in water, physiological saline, methanol, ethanol, phenol, chloroform, dioxan, pyridine, dimethylformamide, diethylene glycol, and hexane; has an absorption in the Infra-red spectrum at 1550 and 1660 cm^{-1} consistent with the presence of peptide; has an absorption in the Infra-red spectrum between 950 and 1100 cm^{-1} with a maximum absorption at 1050 to 1070 cm^{-1} consistent with the presence of carbohydrate; has little or no lipid absorption in the Infra-red spectrum at 2850 to 2950 cm^{-1}; and which glycopeptide, after intravenous administration, increases the liver and spleen weight of mice, and increases the life expectancy of mice with tumours.

4,069,315

RECOVERY OF ZINC FROM IRON-MAKING OR STEEL-REFINING FURNACE DUST

Armand Wagner, Esch, Alzette; Robert Pixius, Dudelange, and Francois Schon, Tetange, all of Luxembourg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxembourg

Filed July 22, 1976, Ser. No. 707,492

Claims priority, application Luxembourg, July 23, 1975, 73039

Int. Cl.² C01G *9/02;* C22B *7/02*

U.S. Cl. 423—105 **9 Claims**

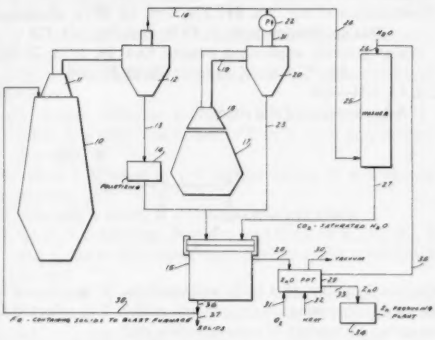
1. A process for recovery of zinc from the dust of a metallurgical plant which comprises the steps of:

a. forming compacts of said dust;

b. saturating water with carbon dioxide; to form a treating solution;

c. treating the compacts of said dust with said water saturated with carbon dioxide for a period and at a temperature sufficient at a pressure of the order of 15 to 40 kg/cm² to solubilize zinc from the dust compacts in the water of the treating solution; and

d. precipitating the zinc from said solution by eliminating carbon dioxide therefrom.

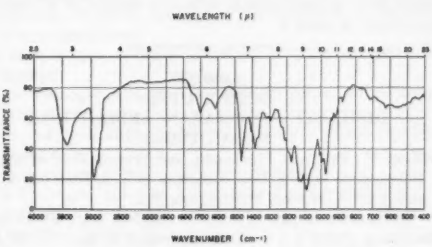


4,069,316

METHOD FOR PRODUCING ANTIBIOTIC T-42082 AND ANTIBIOTIC T-42082

Akira Imada, Nishinomiya; Yukimasa Nozaki, Ikeda; Toru Hasegawa, Kawanishi, and Masahiko Yoneda, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 1, 1976, Ser. No. 737,317
Int. Cl.² A61K *35/00*
U.S. Cl. 424—122 **3 Claims**



1. Antibiotic T-42082 has the following properties:
1. Melting point: 120°–122° C;
2. Elemental analysis: Found 1 C, 62.73; H, 9.23; O, 26.01; 2 C, 62.74; H, 9.36; O, 27.03(%)
3. Molecular weight: 859 (by osmometry):
4. Ultraviolet absorption spectrum; No characteristic absorptions;
5. Infrared absorption spectrum: The dominant absorptions (wave-numbers) measured in KBr disc method are as follows: 2940, 1700, 1462, 1383, 1085, 972 cm^{-1};
6. Thin-layer chromatography; silica gel, ascending method, detected as a brown spot by a spray of 10% aqueous H_2SO_4;

Solvent System	Rf
Ethyl acetate-benzene (1:1)	0.52
Ethyl acetate	0.73
Benzene-acetone (9:1)	0.18
Benzene-acetone (1:1)	0.88
Chloroform-methanol (19:1)	0.87
Chloroform-ethyl acetate (2:3)	0.62

Plate: silica gel plate (kieselgel 60, Merck, Germany)

7. Color reactions:

Color reagent	
Sulfuric acid	Positive (brown)
Aniline-phthalic acid	Positive (indigo blue)
Vanillin-sulfuric acid	Positive (violet)
Molisch	Negative
Dragendorff	Positive (light orange)
Barton	Negative
Molybdenic acid	Negative
Benzidine	Negative
Ninhydrine	Negative
Alkaline potassium permanganate	Negative

8. Solubilities: Soluble in methanol, ethanol, acetone, ethyl acetate, ethyl ether, chloroform, benzene and carbon tetrachloride; sparingly soluble in cyclohexane; and very hardly soluble in water and petroleum ether;

and a pharmaceutical acceptable salt thereof.

3. A method for producing Antibiotic T-42082 which comprises cultivating *Streptomyces hygroscopius* T-42082 (ATCC 31080) in a liquid nutrient medium, aerobically, until substantial antibiotic activity is obtained in the resultant medium and then harvesting the antibiotic from said medium.

4,069,317

N²-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, both of, Japan

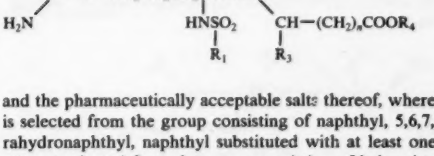
Continuation-in-part of Ser. No. 656,870, Feb. 10, 1976, which is a continuation-in-part of Ser. No. 671,436, March 29, 1976, and Ser. No. 671,568, March 29, 1976, said Ser. No. 671,436, and Ser. No. 671,568, is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,677

Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635

The portion of the term of this patent subsequent to Sept. 6, 1994, has been disclaimed.

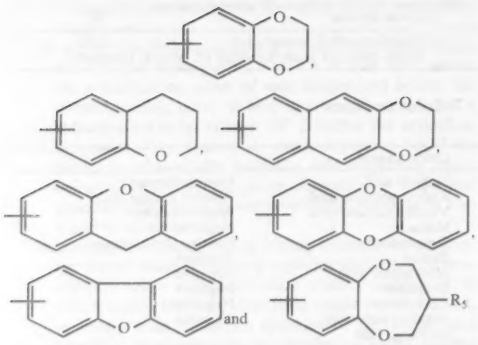
Int. Cl.² A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **9 Claims**

1. N^2-arylsulfonyl-L-argininamides having the formula (I):



(I)

and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl, naphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino, phenyl, phenyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino, C_7–C_{12} aralkyl,



wherein R_5 is hydrogen, C_1–C_{10} alkyl or C_1–C_{10} alkoxy; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl and C_4–C_{10} cycloalkylalkyl; R_3 is selected from the group consisting of C_1–C_5 alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl, C_7–C_{12} aralkyl and ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_4 is hydrogen; and n is an integer of 0, 1 or 2.

4,069,318

N²-ALKOXYNAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 646,522, Jan. 5, 1976, which is a continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,727

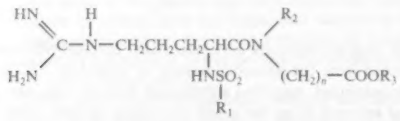
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 **4 Claims**

1. N^2-alkoxynaphthalenesulfonyl-L-argininamides having the formula:



and the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1–C_5 alkoxy; R_2 is C_7–C_{15} aralkyl; R_3 is C_1–C_{10} alkyl, C_6–C_{10} aryl or C_7–C_{12} aralkyl; and n is an integer of 1, 2 or 3.

4,069,319

NOVEL THIADIAZOLES

Jacques Perronnet, Paris, and Laurent Taliani, Les Pavillons-sous-Bois, both of France, assignors to Roussel UCLAF, Paris, France

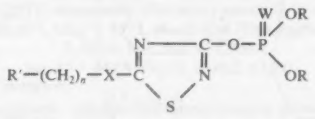
Continuation of Ser. No. 517,379, Oct. 23, 1974, abandoned. This application Sept. 8, 1976, Ser. No. 721,373

Claims priority, application France, Oct. 26, 1973, 73 38223

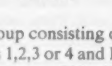
Int. Cl.² A61K *31/425;* C07D *285/08*

U.S. Cl. 424—200 **24 Claims**

1. A compound of the formula



wherein R is alkyl of 1 to 3 carbon atoms, W is selected from the group consisting of oxygen and sulfur, X is selected from the group consisting of —O—, —S— and



R″ is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, n is 1,2,3 or 4 and R′ is selected from the group consisting of hydrogen, —CN, alkoxy of 1 to 3 carbon atoms, alkoxycarbonyl of 2 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, phenyl optionally substituted with one member of the group consisting of halogen, alkyl of 1 to 3 carbon atoms and alkoxy of 1 to 3 carbon atoms or substituted with two members of the group consisting of halogen, alkyl of 1 to 3 carbon atoms and alkoxy of 1 to 3 carbon atoms.

22. An insecticidal composition comprising an insecticidally effective amount of at least one compound of claim 1 and a carrier.

23. A method of combatting insects comprising contacting insects with an insecticidally effective amount of at least one compound of claim 1.

4,069,320

SUBSTITUTED DIPHENYL-3-FORMAZANCARBONITRILE INSECTICIDES

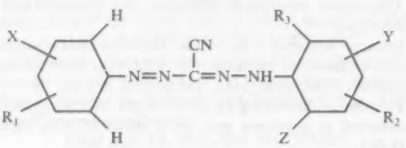
William W. Prichard, Hockessin, and Francis Wilfred Stacey, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 510,546, Sept. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 487,027, July 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 429,029, Dec. 19, 1973, abandoned. This application Jan. 23, 1976, Ser. No. 651,954

Int. Cl.² A01N *9/20;* C07C *107/00*

U.S. Cl. 424—226 **124 Claims**

1. A compound of the formula



wherein:

X is trifluoromethoxy, trifluoromethylthio, 1,1,2,2-tetrafluoroethoxy, 1,1,2,2-tetrafluoroethylthio, pentafluoroethoxy, pentafluoroethylthio, pentafluorothio, cyano, trifluoromethyl, chlorine, bromine, fluorine or nitro;

Y is hydrogen, trifluoromethoxy, trifluoromethylthio,

1,1,2,2-tetrafluoroethoxy, 1,1,2,2-tetrafluoroethylthio, pentafluoroethoxy, pentafluoroethylthio, pentafluorothio, chlorine, bromine, fluorine, trifluoromethyl, or alkyl of 1–4 carbon atoms;

R_1 is hydrogen, chlorine, bromine, fluorine or trifluoromethyl;

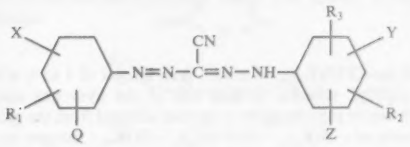
R_2 is hydrogen, chlorine, bromine, fluorine or trifluoromethyl;

R_3 is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, or nitro;

Z is hydrogen, chlorine, bromine, or fluorine, provided

1. when X is nitro at least one of Y or R_3 must be trifluoromethyl;
2. when Y is alkyl of 1–4 carbon atoms, X is trifluoromethyl;
3. when R_3 is nitro, X is trifluoromethyl; and
4. when X is halogen, no more than three of R_1, R_2, R_3, Z and Y can be hydrogen, or an agriculturally suitable salt thereof.

38. A method of controlling insects which consists essentially of applying to the locus of infestation, to the area to be protected, or to the insects themselves, an insecticidally effective amount of a compound of the formula:



wherein:

X is trifluoromethoxy, trifluoromethylthio, 1,1,2,2-tetrafluoroethoxy, 1,1,2,2-tetrafluoroethylthio, pentafluoroethoxy, pentafluoroethylthio, pentafluorothio, cyano, trifluoromethyl, chlorine, bromine, fluorine or nitro;

Y is hydrogen, trifluoromethoxy, trifluoromethylthio, 1,1,2,2-tetrafluoroethoxy, 1,1,2,2-tetrafluoroethylthio, pentafluoroethoxy, pentafluoroethylthio, pentafluorothio, chlorine, bromine, fluorine, trifluoromethyl, or alkyl of 1–4 carbon atoms;

R_1 is hydrogen, chlorine, bromine, fluorine, or trifluoromethyl;

R_2 is hydrogen, chlorine, bromine, fluorine, or trifluoromethyl;

R_3 is hydrogen, chlorine, bromine, fluorine, trifluoromethyl or nitro;

Z is hydrogen, chlorine, bromine, or fluorine, and

Q is hydrogen, chlorine, bromine, or fluorine, provided

1. when Y is alkyl of 1–4 carbon atoms, X is trifluoromethyl;
2. when X is 4-chloro, 4-bromo or 4-fluoro and R_1, Q, and three of R_2, Z, Y and R_3 are hydrogen, then the remainder of R_2, Z, Y and R_3 must be other then 4-chloro, 4-bromo or 4-fluoro;
3. when X is nitro, R_3 is other than hydrogen; and
4. when X is halogen, at least one of R_1, R_2, R_3, Q, Y and Z must be other than hydrogen;

or an agriculturally suitable salt thereof.

4,069,321

BLOCKED CHOLECALCIFEROL AND DIHYDROTACHYSTEROL 3 DERIVATIVES

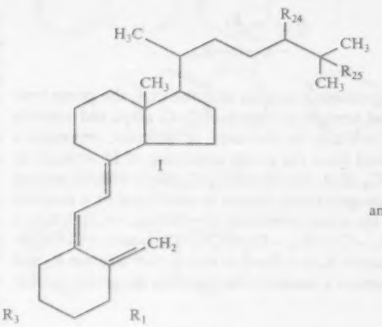
Howard Jones, Holmdel; Shu Shu Yang, Piscataway, and David P. Jacobus, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 621,976, Oct. 14, 1975. This application Sept. 13, 1976, Ser. No. 722,443

Int. Cl.[2] **A61K** *31/59*; **C07J** *9/00*

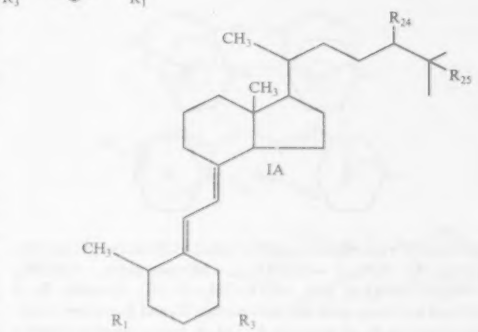
U.S. Cl. 424—236 **11 Claims**

11. A method of treating steroid-induced osteoporosis, senile osteoporosis and secondary hyderparathyroidism which comprises administering to a patient a therapeutically effective amount of a compound of the formulae:



I

and



IA

wherein

R_1 is hydrogen, hydroxy, C_{1-5}alkanoyloxy, substituted C_{1-5}alkanoyloxy, branched C_{3-5}alkanoyloxy, benzoyloxy or p-nitro-benzoyloxy,

R_3, R_{24} and R_{25} are hydrogen, hydroxy, C_{1-5}alkanoyloxy, substituted C_{1-5}alkanoyloxy, branched C_{3-5}alkanoyloxy, benzoyloxy, p-nitro-benzoyloxy, halo or O—C_{1-5}alkyl carbamate with the proviso that R_{25} is halo or O—C_{1-5}alkyl carbamate.

4,069,322

PRO-DRUGS FOR THE IMPROVED DELIVERY OF CERTAIN SELECTED ANTI-INFLAMMATORY STEROIDS

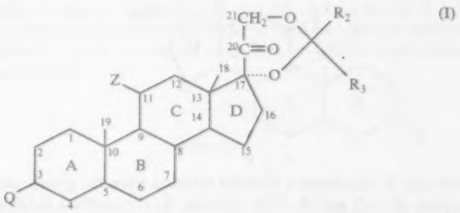
Nicolae S. Bodor, Lawrence, and Kenneth B. Sloan, Eudora, both of Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Oct. 12, 1976, Ser. No. 731,373

Int. Cl.[2] **A61K** *31/58*; **C07J** *17/00*

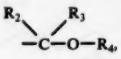
U.S. Cl. 424—241 **37 Claims**

12. A pharmaceutical composition of matter comprising an anti-inflammatory effective amount of a pro-drug compound of the formula:

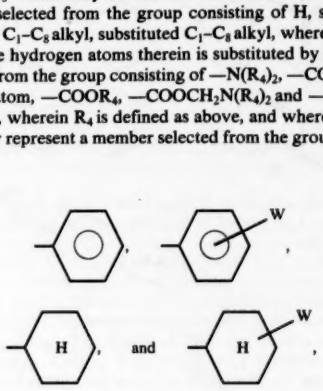


(I)

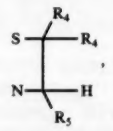
wherein Z represents a member selected from the group consisting of =O, β—OH and β—O—R_1, wherein R_1 represents



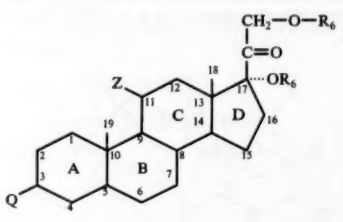
wherein R_4 represents a member selected from the group consisting of H and straight or branched C_1–C_4 alkyl, and wherein R_2 and R_3 which may be the same or different, represent a member selected from the group consisting of H, straight or branched C_1–C_8 alkyl, substituted C_1–C_8 alkyl, wherein at least one of the hydrogen atoms therein is substituted by a member selected from the group consisting of —$N(R_4)_2$, —$CON(R_4)_2$, a halogen atom, —$COOR_4$, —$COOCH_2N(R_4)_2$ and —$COOCH_2$—S—R_4, wherein R_4 is defined as above, and wherein R_2 and R_3 further represent a member selected from the group consisting of



wherein W represents a member selected from the group consisting of —$N(R_4)_2$, —$CON(R_4)_2$, a halogen atom, —$COOR_4$, —$COOCH_2N(R_4)_2$ and —$COOCH_2$—S—R_4, wherein R_4 is defined as above, with the proviso that R_2 and R_3 cannot simultaneously be H or wherein R_2 and R_3 taken together further represent a member selected from the group consisting of cyclic alkyl [—$(CH_2)_n$—] and cyclic heteroalkyl, wherein one of the carbon atoms is substituted by a member selected from the group consisting of <N—R_4, <—COR_4 and —CO, wherein n is an integer of 5 to 7 and wherein R_4 is defined as above; wherein Q represents

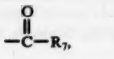


wherein R_4 is defined as above, and R_5 represents H, $COOR_4$ and —$CON(R_4)_2$, wherein R_4 is defined as above, provided that the C_4–C_5 double bond in formula (I) is subject to migration to the C_5–C_6 position; and wherein with respect to ring (A) in formula (I), the bond between C_1 and C_2 can be a single or double bond.

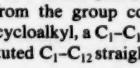


(II)

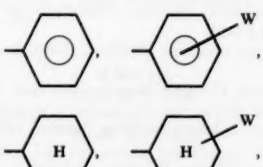
wherein Z represents a member selected from the group consisting of =O and β—OH; wherein R_6 represents a member selected from the group consisting of H and



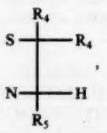
with the proviso that one of said R_6 is H, wherein R_7 represents a member selected from the group consisting of a C_1–C_{12} straight, branched or cycloalkyl, a C_1–C_{12} straight, branched or cycloalkenyl, a substituted C_1–C_{12} straight, branched or cycloalkyl or alkenyl,



—$(CH_2)_n$—$CON(R_2)_2$, wherein n is an integer of 1 to 6, a 2, 3 or 4 pyridyl, wherein at least one of the hydrogen atoms therein can be substituted by a member selected from the group consisting of —$N(R_4)_2$, —$CON(R_4)_2$, —SOR_4, a halogen atom, —$COOR_4$, —$COOCH_2N(R_4)_2$ and —$COOCH_2$—S—R_4, wherein R_4 is defined above,



wherein W is defined above; wherein Q represents



wherein R_4 is defined as above and R_5 represents a member selected from the group consisting of H, $COOR_4$ and —$CON(R_4)_2$, wherein R_4 is defined as above; wherein the bond between C_1 and C_2 in ring "A" of formula (II) can be a single or a double bond; and wherein, with respect to ring "A" in formula (II), the double bond between C_4 and C_5 is subject to migration to the C_5–C_6 position.

4,069,323

N^2-SUBSTITUTED-L-ARGININE DERIVATIVES AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application July 8, 1976, Ser. No. 703,704

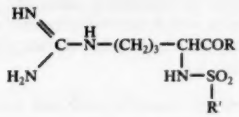
Claims priority, application Japan, Aug. 8, 1975, 50-96417; Sept. 2, 1975, 50-106139; Sept. 11, 1975, 50-110242; Oct. 1, 1975, 50-118525; Oct. 7, 1975, 50-121173; Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/445;* C07D *211/16*

U.S. Cl. 424—244 22 Claims

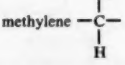
1. N^2-substituted-L-arginine esters and amides having the formula:



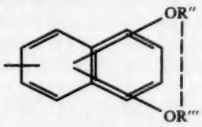
and the pharmaceutically acceptable acid addition salts thereof, wherein R is selected from the group consisting of (1) $—OR_1$, wherein R_1 is selected from the group consisting of C_1–C_{10} alkyl, C_3–C_{10} cycloalkyl, C_1–C_{10} haloalkyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl and C_7–C_{15} aralkyl,

(2)

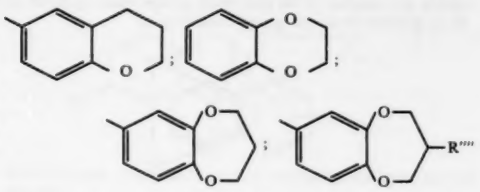
wherein R_2 and R_3 are selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_7–C_{15} aralkyl, and C_1C_{10} alkyl substituted with a group selected from C_1–C_{10} alkoxy, C_2–C_{10} alkoxycarbonyl and carboxy; and (3) -N Z, wherein Z is a divalent group which consists of at least two groups selected from methylene $—CH_2—$ and monosubstituted



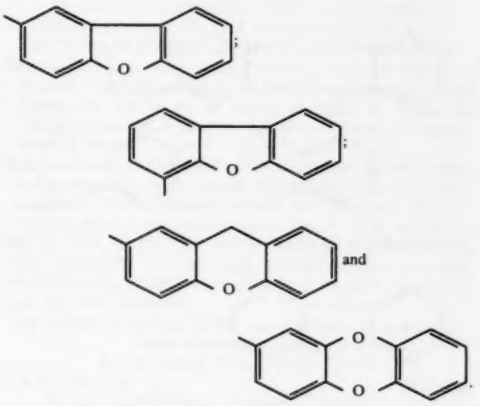
wherein R_4 is selected from the group consisting of C_1–C_{10} alkyl and C_1–C_{10} alkoxy, which are combined in an arbitrary order, the number of the combined groups being up to 20; and R′ is selected from the group consisting of



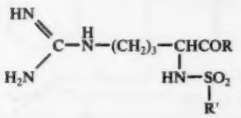
wherein R″ and R‴ when considered separately are C_1–C_{10} alkyl, or R″ and R‴ when taken together are C_1–C_{10} alkylene;



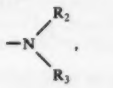
wherein R⁗ is C_1–C_{10} alkoxy;



22. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N^2-substituted-L-arginine ester or amide having the formula:

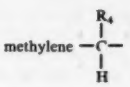


or a pharmaceutically acceptable acid addition salt thereof, wherein R is selected from the group consisting of (1) $—OR_1$, wherein R_1 is selected from the group consisting of C_1–C_{10} alkyl, C_3–C_{10} cycloalkyl, C_1–C_{10} haloalkyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl and C_7–C_{15} aralkyl;



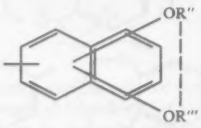
(2)

wherein R_2 and R_3 are selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_7–C_{15} aralkyl, and C_1–C_{10} alkyl substituted with a group selected from C_1–C_{10} alkoxy, C_2–C_{10} alkoxycarbonyl and carboxy; and (3) -NZ, wherein Z is a divalent group which consists of at least two groups selected from the group consisting of methylene $—CH_2—$ and monosubstituted

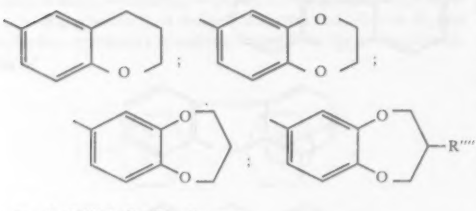


wherein R_4 is selected from the group consisting of C_1–C_{10}

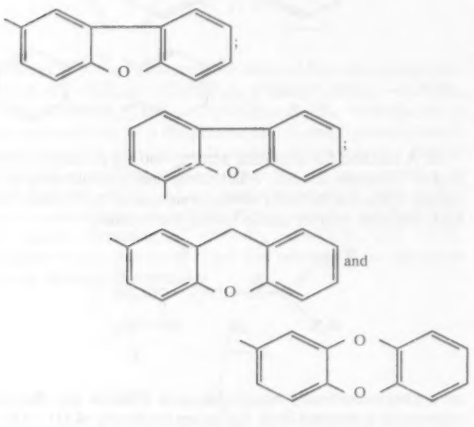
alkyl and C_1–C_{10} alkoxy, which are combined in an arbitraary order, the number of the combined groups being up to 20; and R′ is selected from the group consisting of



wherein R″ and R‴ when considered separately are C_1–C_{10} alkyl, or R″ and R‴ when taken together are C_1–C_{10} alkylene;



wherein R⁗ is C_1–C_{10} alkoxy;



4,069,324

SUBSTITUTED 7(α-AMINO PHENYLACETAMIDO)CEPHEM DERIVATIVES

Rene Wiederkehr, Pfeffingen, and Hans Bickel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 9, 1976, Ser. No. 713,076

Claims priority, application Switzerland, Aug. 20, 1975, 10822/75

Int. Cl.² A61K *31/54;* C07D *501/16*

U.S. Cl. 424—246 **6 Claims**

1. A 7β-[D-2-amino-2-(lower alkylsulphonylamino-phenyl)-acetylamino]-3-R-3-cephem-4-carboxylic acid (I), in which R denotes lower alkoxy or halogen with an atomic number of up to 35, or a pharmaceutically acceptable salt thereof.

5. An antibacterial formulation for the treatment of animals infected with pathogenic bacteria comprising an antibacterially effective amount of a compound of the formula I according to claim 1 and a pharmaceutically acceptable carrier.

6. A method for the treatment of animals infected with pathogenic bacteria which comprises administering to said animals an antibacterial formulation according to claim 5.

4,069,325

3-CARBALKOXYAMINO-1H-2,1,4-BENZOTHIADIAZINE DERIVATIVES

Heinz Loewe, Ke'kheim, Taunus; Josef Urbanietz, Schwalbach, Taunus; Dieter Duwel, Hofheim, Taunus, and Reinhard Kirsch, Niederjosbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

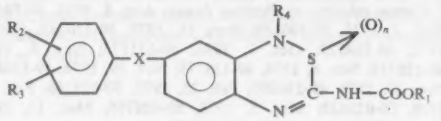
Filed Sept. 17, 1976, Ser. No. 724,246

Claims priority, application Germany, Sept. 19, 1975, 2541742

Int. Cl.² C07D *285/16;* A61K *31/54*

U.S. Cl. 424—246 **7 Claims**

1. A compound of the formula



wherein R_1 is alkyl having 1 to 4 carbon atoms; R_2 and R_3 are the same or different and are each hydrogen, alkoxy having 1 to 4 carbon atoms, halogen, trifluoromethyl, alkyl having 1 to 4 carbon atoms, or cyano; R_4 is hydrogen, alkanoyl having 2 to 4 carbon atoms, or benzoyl; *n* is 0 or 1: and X is —O—SO_2—or —SO_2—O—.

4. The method of combatting helminths in an organism infested therewith, which method comprises administering to said organism an anthelmintically-effective amount of a compound as in claim 1.

4,069,326

MORPHOLINO CONTAINING INDANE ACETIC ACID ESTERS

Jean-Marie Teulon, La Celle Saint-Cloud, France, assignor to Societe Anonyme dite: Societe Hexachimie, Rueil-Malmaison, France

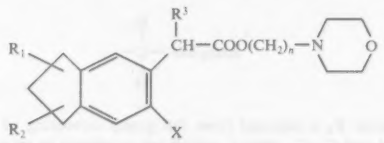
Division of Ser. No. 546,095, Jan. 31, 1975. This application May 27, 1976, Ser. No. 690,391

Claims priority, application United Kingdom, Feb. 7, 1974, 5726/74; Aug. 23, 1974, 37220/74; Dec. 16, 1974, 54292/74

Int. Cl.² C07D *295/14;* A61K *31/535*

U.S. Cl. 424—248.55 **8 Claims**

1. A compound of the general formula



in which:

X represents a hydrogen or halogen atom; R_1 and R_2, which may be identical or different, each represents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms or a cycloalkyl group containing 3 to 7 carbon atoms; R_3 represents a hydrogen atom or an alkyl group containing 1 to 5 carbon atoms; and *n* is an integer of 1 to 5; or a pharmaceutically acceptable addition salt of said compound.

8. A method of treating inflammations, algias, rheumatisms or pain syndromes in animals which method comprises administering to the animal a therapeutically effective amount of at least one compound as defined in claim 1.

4,069,327

PHARMACOLOGICALLY ACTIVE THIOUREA AND UREA COMPOUNDS AS INHIBITORS OF H-2 HISTAMINE RECEPTORS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

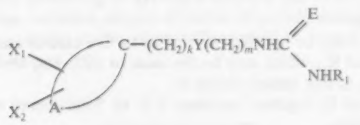
Division of Ser. No. 637,494, Dec. 4, 1975, Pat. No. 4,018,931, which is a division of Ser. No. 451,333, March 14, 1974, Pat. No. 3,950,353, which is a continuation-in-part of Ser. No. 290,584, Sept. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Jan. 5, 1977, Ser. No. 758,291

Claims priority, application United Kingdom, Mar. 9, 1971, 6352/71; July 22, 1977, 34334/71; Aug. 8, 1972, 37015/72; Ireland, Feb. 3, 1972, 136/72

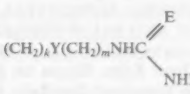
Int. Cl.[2] A61K *31/495, 31/505*

U.S. Cl. 424—250 13 Claims

1. A pharmacaceutical composition to inhibit H-2 histamine receptors comprising a pharmaceutical carrier and in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a pyrimidine, pyrazine or pyridazine ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen, k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is oxygen or sulphur; and R_1 is hydrogen, lower alkyl, benzoyl or di-lower alkylaminolower alkyl or a pharmaceutically acceptable addition salt thereof.

4,069,328

PHARMACEUTICAL COMPOSITIONS CONTAINING AN N-(FURYL-METHYL)-2'-HYDROXY-5,9,9-TRIMETHYL BENZOMORPHAN AND METHOD OF USE

Adolf Langbein; Herbert Merz; Gerhard Walther, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

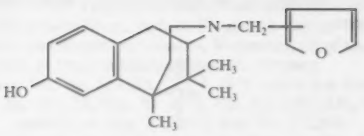
Division of Ser. No. 599,427, July 28, 1975, Pat. No. 4,010,164, which is a continuation-in-part of Ser. No. 454,964, March 27, 1974, abandoned. This application Oct. 15, 1976, Ser. No. 732,708

Claims priority, application Germany, Mar. 28, 1973, 2315339

Int. Cl.[2] A61K *31/445, 31/455*

U.S. Cl. 424—266 12 Claims

1. An analgesic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective analgesic amount of a compound of the formula



or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,069,329

N^2-NAPHTHALENESULFONYL-L-ARGININE DERIVATIVES, AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto, Kobe; Ryoji Kikumoto, Machida; Yoshikuno Tamao, Yokohama; Kazuo Ohkubo, Machida, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, both of, Japan

Continuation-in-part of Ser. No. 671,435, March 29, 1976, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,740

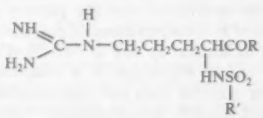
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/445;* **C07D** *211/16*

U.S. Cl. 424—267 9 Claims

1. N^2-naphthalenesulfonyl-L-arginine amides having the formula



or the acid addition salts thereof with a pharmaceutically acceptable acid wherein R is selected from the class consisting of (1) alkoxy, alkenyloxy, alkynyloxy and cycloalkoxy, respectively containing not more than 10 carbon atoms, aralkyloxy of not more than 15 carbon atoms, tetrahydrofurfuryloxy, and alkoxy of not more than 10 carbon atoms substituted with an alkoxy group of not more than 10 carbon atoms, halogen or nitro;

(2)

wherein R_1 is selected from the class consisting of alkenyl of not more than 10 carbon atoms, and substituted alkyl containing not more than 20 carbon atoms wherein said substituent is a member selected from the class consisting of alkoxy, alkoxycarbonyl, arylcarbamoyl, acyl, acyloxy, N,N-polymethylenecarbamoyl and carboxy; and R_2 is selected from the class consisting of hydrogen; alkyl and alkenyl, respectively containing not more than 10 carbon atoms; and substituted alkyl containing not more than 20 carbon atoms wherein said substituent is a member selected from the class consisting of alkoxy, alkoxycarbonyl, arylcarbamoyl, acyl, acyloxy, N,N-polymethylenecarbamoyl and carboxy; and

(3)

wherein Z is a divalent group containing up to 20 carbon

atoms, which consists of more than one group selected from the class consisting of methylene—CH_2—, mono-substituted methylene

wherein R_3 is selected from the class consisting of alkyl, acyl, alkoxy and alkoxycarbonyl, respectively containing not more than 10 carbon atoms, and carbamoyl; and disubstituted methylene

wherein R_4 and R_5 are alkyl groups of not more than 10 carbon atoms, and which may further contain at least one member selected from the class consisting of cycloalkylene of not more than 10 carbon atoms, phenylene

and carbonyl ;

which may be arranged in any order and complete the

ring together with said methylene, monosubstituted methylene or disubstituted methylene; with the proviso that Z is not polymethylene of 3–10 carbon atoms or polymethylene of 3–10 carbon atoms substituted by one or two alkyl groups of not more than 10 carbon atoms; and R′ is 1-naphthyl substituted with a member selected from the class consisting of 2-dialkylamino, 3-dialkylamino, 4-dialkylamino, 6-dialkylamino, 7-dialkylamino, 8-dialkylamino, respectively, containing not more than 20 carbon atoms, and 5-dialkylamino containing 3–20 carbon atoms; or 2-naphthyl substituted with dialkylamino containing not more than 20 carbon atoms.

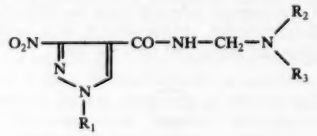
9. A pharmaceutical composition which comprises an antithrombotically effective amount of a compound of claim 1 and a pharmaceutically acceptable adjuvant.

4,069,330
NITROPYRAZOLE COMPOUNDS AND ANTI-MICROBIAL COMPOSITIONS

Herbert Berger, Mannheim-Kafertal; Rudi Gall, Hirschberg-Grossachsen; Max Thiel, Mannheim; Wolfgang Schaumann, Heidelberg, and Wolfgang Vomel, Mannheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Apr. 20, 1976, Ser. No. 678,588
Claims priority, application Germany, May 22, 1975, 2522688
Int. Cl.[2] A61K *31/415;* **C07D** *231/16*
U.S. Cl. 424—267 **13 Claims**

1. Nitropyrazole compound of the formula



wherein

R_1 is alkyl or hydroxyalkyl of up to five carbon atoms

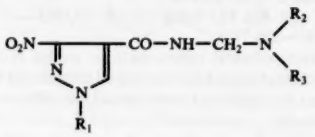
R_2 and R_3, which may be the same or different, are alkyl of up to five carbon atoms or

R_2 and R_3 together represent a 4- or 5-membered alkylene bridge,

and the pharmacologically compatible salts thereof.

9. Therapeutic compositions having anti-microbial activity comprising a pharmaceutically acceptable carrier and, in anti-microbially effective amounts, a compound as claimed in claim 1.

10. Method of combating microbial infections in subject which method comprises administering to the subject anti-microbially effective amounts of a nitropyrazole compound of the formula



wherein

R_1 is alkyl or hydroxyalkyl of up to five carbon atoms

R_2 and R_3, which may be the same or different, are alkyl of up to five carbon atoms or

R_2 and R_3 together represent a 4- or 5-membered alkylene bridge,

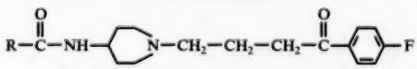
and the pharmacologically compatible salts thereof.

4,069,331
N-(P-FLUOROBENZOYL-N-PROPYL)-4-PIPERIDYLAMIDES AND SALTS THEREOF

Adolf Langbein, Ingelheim am Rhine; Peter Danneberg, Ockenheim, and Franz Josef Kuhn, Bingen am Rhine, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

Continuation-in-part of Ser. No. 664,761, March 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 575,940, May 9, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,001
Claims priority, application Germany, May 16, 1974, 2423897
Int. Cl.[2] C07D *211/58*
U.S. Cl. 424—267 **10 Claims**

1. A compound of the formula



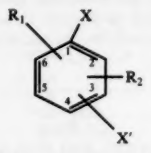
wherein R is alkyl of 1 to 4 carbon atoms, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,069,332
COMPOUNDS, COMPOSITIONS AND METHODS OF USE

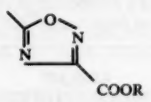
John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 10, 1976, Ser. No. 721,882
Int. Cl.[2] A61K *31/42;* **C07D** *271/06*
U.S. Cl. 424—272 **13 Claims**

1. A compound of the formula



wherein X' is at the 3 or 4 position, is the same as X and is



wherein

R is selected from the group consisting of hydrogen, alkyl of one to eight carbon atoms, inclusive, and a physiologically acceptable metal or amine cation;

R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive, phenyl, cyano, nitro, trifluoromethyl, fluoro, chloro and bromo.

4,069,333

ANTI-HYPERTENSIVE COMPOSITIONS

Clement A. Stone, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

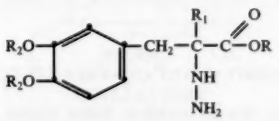
Division of Ser. No. 657,824, Feb. 13, 1976. This application Feb. 8, 1977, Ser. No. 766,636

Int. Cl.[2] A61K *31/42, 31/24, 31/195*

U.S. Cl. 424—272 **5 Claims**

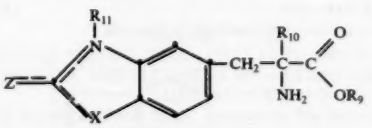
1. A pharmaceutical composition for treating hypertension comprising

A. a decarboxylase inhibitor compound having the formula



wherein R, R_1, R_2 and R_3 are independently selected from hydrogen and C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof and

B. an arylalanine having the formula:



wherein

R_9, R_{10}, and R_{11} are independently selected from hydrogen and C_1–C_4 alkyl,

X is O

Z is = O or —O—R_{13} wherein R_{13} is selected from hydrogen or C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof in an effective amount.

4,069,334

PYRAZOLE DERIVATIVES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

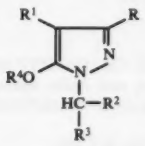
Division of Ser. No. 619,891, Oct. 6, 1975, which is a division of Ser. No. 532,311, Dec. 13, 1974, Pat. No. 4,002,641. This application Mar. 31, 1976, Ser. No. 672,500

Claims priority, application Germany, Dec. 20, 1973, 2363511

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 P **23 Claims**

1. A pharmaceutical composition useful for effecting diuresls and saluresis and for treating hypertension in humans and animals which comprises a diuretically effective amount, a saluretically effective amount or an antihypertensive amount of a compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen, trifluoromethyl or lower alkyl;

R^1 is hydrogen, trifluoromethyl or lower alkyl;

R^2 is lower alkyl;

R^3 is phenyl substituted by:

a. one or two of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, and alkoxy of 1 to 6 carbon atoms;

b. cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms or nitro;

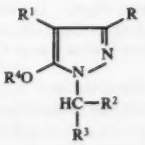
c. one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro and one or two substituents selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen and trifluoromethyl; or

R^3 is naphthyl; and

R^4 is R^5CO wherein R^5 is phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, trifluoromethyl, nitro and halogen,

in combination with a phamaceutically acceptable non-toxic inert diluent or carrier.

13. A method of effecting diuresis or saluresis in humans and animals or treating hypertension in humans and animals which comprises administering to a human or animal in need thereof a diuretically effective amount, a saluretically effective amount or an antihypertensive amount of a compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen, trifluoromethyl or lower alkyl;

R^1 is hydrogen or lower alkyl;

R^2 is lower alkyl;

R^3 is phenyl substituted by:

a. one or two of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, and alkoxy of 1 to 6 carbon atoms;

b. cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms or nitro;

c. one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro and one or two substituents selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen and trifluoromethyl; or

R^3 is naphthyl; and

R^4 is R^5CO wherein R^5 is phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to b 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, trifluoromethyl, nitro and halogen,

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier

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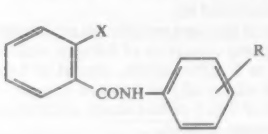
4,069,335
AGRICULTURAL GERMICIDAL COMPOSITION

Seigo Kawada, Fujieda; Nobuya Ohta, and Akira Sakamoto, both of Shizuoka, all of Japan, assignors to Kumial Chemical Industry Co., Ltd., Tokyo, Japan

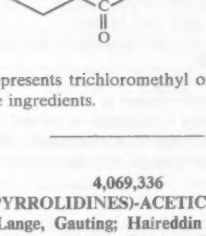
Filed Feb. 25, 1976, Ser. No. 661,152
Int. Cl.[2] A01N *9/22, 9/24*
U.S. Cl. 424—274 8 Claims

1. An agricultural fungicidal composition, which comprises: one part of a benzanilide of the formula:



(I)

wherein X represents halogen or methyl and R represents hydrogen, C_{1-5} alkyl or a C_{1-5} alkoxy with from 0.1–10 parts of a phthalimide of the formula:



(II)

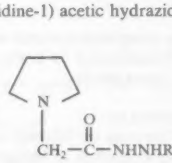
wherein R^1 represents trichloromethyl or 1,1,2,2-tetrachloroethyl as active ingredients.

4,069,336
(2-OXO-PYRROLIDINES)-ACETIC HYDRAZIDES

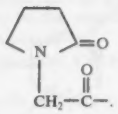
Fritz-Walter Lange, Gauting; Haireddin Jacobi, Leichlingen, Rhineland, and Jens Müller, Gauting, all of Germany, assignors to Chemisches Laboratorium Fritz-Walter Lange GmbH & Co KG, Gauting, Germany

Filed Feb. 25, 1976, Ser. No. 661,138
Int. Cl.[2] A61K *31/40;* C07D *207/26, 403/12*
U.S. Cl. 424—274 5 Claims

1. (2-oxo-pyrrolidine-1) acetic hydrazides of the formula I,



where R1 denotes a group of the formula II,



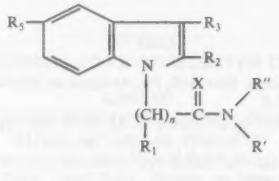
2. A pharmaceutical preparation useful as a psychopharmacon and for treatment of diseases occurring in the cerebral function region of the brain containing, as an active ingredient, an effective amount of a compound of claim 1, together with suitable pharmaceutical inert carrier and auxiliary substances.

4,069,337
2-SUBSTITUTED-INDOLE-1-LOWER-ALKANECARBOXAMIDES HAVING ANTI-SECRETORY OR ANTI-ULCER ACTIVITY

Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 624,334, Oct. 21, 1975, Pat. No. 4,021,448.
This application Dec. 1, 1976, Ser. No. 746,516
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 1 Claim

1. A method of reducing gastric secretion and incidence of ulcer formation in humans comprising orally administering thereto an effective anti-secretory or anti-ulcer amount of a 2-R_2-3-R_3-5-R_5-1-indole-lower-alkanecarboxamide having the formula:



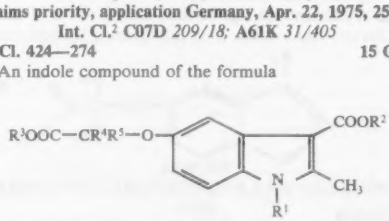
where R′ is hydrogen or methyl; R″ is hydrogen, methyl or $(CH_2)_mOH$, where *m* is 0, 2 or 3; R_1 is hydrogen or methyl; R_2 is methyl, ethyl, phenyl or hydroxymethyl; R_3 is methyl, ethyl, hydroxymethyl, trifluoroacetyl or 2,2,2-trifluoro-1hydroxyethyl; R_5 is hydrogen, chlorine or fluorine; X is O or S; and *n* is 0, 1, 2 or 3, n being 0 only when R_5 is chlorine.

4,069,338
INDOLE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Erich Schacht; Werner Mehrhof; Detlev Kayser, and Zdenek Simane, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Apr. 13, 1976, Ser. No. 676,561
Claims priority, application Germany, Apr. 22, 1975, 2517659
Int. Cl.[2] C07D *209/18;* A61K *31/405*
U.S. Cl. 424—274 15 Claims

1. An indole compound of the formula



wherein R^1, R^2 and R^3 are identical or different and each is H or alkyl of 1–6 carbon atoms; R^4 is H or methyl and R^5 is, phenyl or chlorophenyl, and physiologically acceptable salts thereof.

13. A method of lowering the cholesterol level in the blood

of mammals comprising administering to a patient a daily dosage of a compound of claim 1, in admixture with a pharmaceutically-acceptable carrier, effective to lower the cholesterol level.

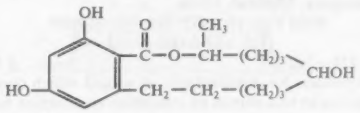
4,069,339

NOVEL METHOD FOR THE DEPRESSION OF FAT DEPOSITION IN SWINE

Donald Lee Ingle, Trenton, and Ronald Howell Dalrymple, Titusville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 22, 1977, Ser. No. 770,483
Int. Cl.[2] A61K *31/365*
U.S. Cl. 424—279 4 Claims

1. A method for the depression of fat deposition in swine comprising the step of: subcutaneously administering to swine by implant an effective amount ranging from 0.0001 mg/kg to 0.20 mg/kg of animal weight of a compound of formula:



wherein said compound is the racemic mixture and the optical isomers thereof.

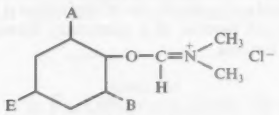
4,069,340

IMMONIUM SALTS AND DERIVATIVES THEREOF

Victor A. Pattison, Clarence Center, and Russell L. K. Carr, Grand Island, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 653,694, Jan. 30, 1976, abandoned, which is a continuation of Ser. No. 663,897, Aug. 28, 1967, abandoned. This application Feb. 26, 1976, Ser. No. 661,681
Int. Cl.[2] C07C *119/00*
U.S. Cl. 424—298 13 Claims

1. The compound of the formula



wherein A, B and E are independently selected from the group consisting of hydrogen, alkyl of 1 to 30 carbon atoms, and α-haloalkyl of 1 to 30 carbon atoms, wherein said halo is independently selected from the group consisting of chlorine, bromine and fluorine.

4,069,341

OXYBIS(4,1-PHENYLENE(2-OXO-2,1-ETHANEDIYL)) THIOCYANATE AND ITS USE AS AN ANTIMICROBIAL AGENT

James K. Pierce, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 18, 1976, Ser. No. 733,608
Int. Cl.[2] A01N *9/18;* C07C *161/04*
U.S. Cl. 424—302 3 Claims

1. Oxybis(4,1-phenylene(2-oxo-2,1-ethanediyl)) thiocyanate.

2. A method of inhibiting the growth of susceptible bacteria and fungi which comprises applying thereto an antimicrobially effective amount of oxybis(4,1-phenylene(2-oxo-2,1-ethanediyl)) thiocyanate.

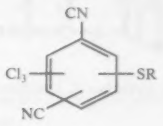
4,069,342

METHOD FOR REGULATING RESTS USING ALKYLTHIOTRICHLORODICYANOBENZENES

Thomas A. Magee, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 423,937, Dec. 12, 1973, abandoned. This application Oct. 30, 1974, Ser. No. 519,343
Int. Cl.[2] A01N *9/12, 9/14;* C07C *121/54*
U.S. Cl. 424—304 2 Claims

1. A method for regulating pests selected from the group consisting of bacteria and fungi which comprises contacting the pest environment with a pesticidally-effective amount of a compound of the formula



wherein R is methyl or ethyl.

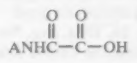
4,069,343

OXAMIC ACID DERIVATIVES FOR THE PREVENTION OF IMMEDIATE TYPE HYPERSENSITIVITY REACTIONS

John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,565
Int. Cl.[2] A61K *31/195*
U.S. Cl. 424—319 14 Claims

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivities, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



in which

A is a member selected from the group consisting of α-naphthyl, β-naphthyl, phenyl, 2,6-dichlorophenyl and substituted phenyl moieties containing from one to three substituents in any of the 2,3,4and 5 positions of the phenyl ring, independently selected from the group consisting of lower alkyl, lower alkylthio, lower akylsulfinyl lower alkoxy, hydroxy(lower)alkoxy, 2-(oxalyloxy)ethoxy, benzyloxy, N-mono- and di- lower alkylamino-(lower)-alkoxy, halo, sulfamyl, polyhalo(lower)alkyl, carbamyl, N-lower alkylcarbamyl, nitro, mono- and di-lower alkylamino, carboxy, lower alkylcarbonyl, carb(lower)alkoxy, phenoxy(lower)alkoxy, and oxalamidophenoxy radicals;

or a pharmaceutically acceptable salt thereof.

4,069,344

INSECTICIDAL SUBSTITUTED PHENYL DERIVATIVES

Friedrich Karrer, Basel, Switzerland, assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

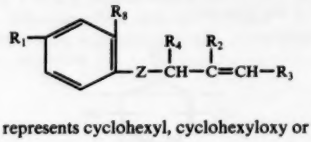
Division of Ser. No. 358,431, May 8, 1973, abandoned. This application Mar. 15, 1976, Ser. No. 667,004

Claims priority, application Switzerland, May 10, 1972, 7011/72; Sept. 29, 1972, 14255/72; Mar. 29, 1973, 4567/73

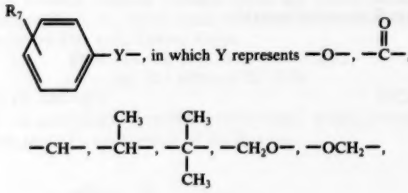
Int. Cl.[2] A01N 9/20; C07C 103/19

U.S. Cl. 424—324 **12 Claims**

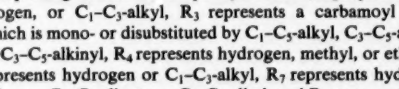
1. A compound of the general formula



wherein R_1 represents cyclohexyl, cyclohexyloxy or the group



or the direct bond, Z represents -O-, or



group being bonded to the phenyl nucleus, R_2 represents hydrogen, or C_1–C_3-alkyl, R_3 represents a carbamoyl group which is mono- or disubstituted by C_1–C_5-alkyl, C_3–C_5-alkenyl or C_3–C_5-alkinyl, R_4 represents hydrogen, methyl, or ethyl, R_6 represents hydrogen or C_1–C_3-alkyl, R_7 represents hydrogen, halogen, C_1–C_5-alkoxy or C_1–C_5-alkyl, and R_8 represents halogen, methyl, or ethyl.

9. An insecticical composition comprising an insecticidally effective amount of a compound of the formula of claim 1, together with a suitable carrier therefor.

4,069,345

COMPOSITIONS HAVING A PHYSIOLOGICAL COOLING EFFECT

John M. Gascoyne, Southall; Roger Hems, Maidenhead, and David J. Spring, Datchet, all of England, assignors to Wilkinson Sword Limited, London, England

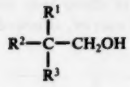
Filed Aug. 16, 1974, Ser. No. 498,173

Claims priority, application United Kingdom, Aug. 22, 1973, 39729/73

Int. Cl.[2] A61K 31/045

U.S. Cl. 424—343 **4 Claims**

1. In a manufactured consumer product for application to or consumption by the human body, said product comprising a topically administrable or orally ingestible vehicle and, as adjuvants in said vehicle, (i) at least one of the following: a flavourant, colourant, perfume, surface active agent or antiseptic, and (ii) a compound capable of stimulating the cold receptors of the nervous system in the surface tissues of the body, or in the mouth, when brought into contact therewith, respectively by topical application or oral ingestion of the said product, the improvement which comprises using as said cold receptor stimulating compound an effective amount of an alcohol of the formula



where

R^1 is C_2–C_6 alkyl;

R^2 is C_2–C_5 alkyl or C_2–C_5 alkenyl;

R^3 is H or C_1–C_5 alkyl;

with the provisos that the total number of carbon atoms in the molecule is from 8–12 and that at least on of R^1 and R^2 has branching in an alpha position.

4,069,346

COMPOSITIONS AND METHODS FOR ANESTHETIZING AN ANIMAL USING DEUTERATED ANALOGUES OF HALOTHANE AND CHLOROFORM

Leslie P. McCarty, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 14, 1977, Ser. No. 768,307

Int. Cl.[2] A61K 31/02

U.S. Cl. 424—350 **6 Claims**

1. The process for anesthetizing an animal which comprises administering to said animal by inhalation an effective anesthetizing amount of the compound 2-bromo-2-chloro-1,1,1-trifluoroethane-d as a general inhalation anesthetic.

4,069,347

COMPOSITIONS OF QUATERNARY AMMONIUM DERIVATIVES OF LANOLIN ACIDS

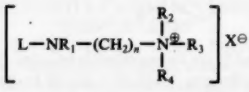
Justin P. McCarthy, Carteret; Mitchell L. Schlossman, Rockaway, both of N.J., and Lee R. Mores, Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Aug. 2, 1976, Ser. No. 711,088

Int. Cl.[2] A61K 7/08

U.S. Cl. 424—358 **13 Claims**

1. An improved quaternary ammonium composition comprising (a) 35–75 weight percent of an aliphatic, saturated, branched-chain diol having from 5 to 20 carbon atoms with at least three carbon atoms separating the hydroxyl groups and at least two alkyl groups having a total of at least three carbon atoms, one of the alkyl groups being attached to the carbon atom immediately adjacent to one of the hydroxyl groups, and (b) 25–65 weight percent of a quaternary ammonium compound of the formula



where L represents the acyl radicals derived from lanolin fatty acids, R_1 is hydrogen or an alkyl group containing one to four carbon atoms, R_2 and R_3 are C_{1-4} alkyl groups, R_4 is a group selected from the group consisting of alkyl, aralkyl, hydroxyalkyl and unsaturated aliphatic hydrocarbon radicals, X is an anion selected from the group consisting of halide, nitrate, sulfate, alkylsulfate and alkylphosphate and n is an integer from 2 to 5.

4,069,348

PACKAGE AND METHOD OF FORMING THE SAME

Robert G. Bush, Green Bay, Wis., assignor to L. D. Schreiber Cheese Company, Inc., Wis.

Continuation of Ser. No. 499,788, Aug. 22, 1974, abandoned. This application Oct. 8, 1976, Ser. No. 730,924

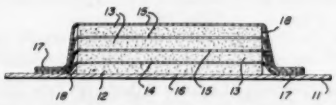
Int. Cl.[2] B65D 83/08, 85/76

U.S. Cl. 426—119 **25 Claims**

1. A sealed package of individually sealed compartments

comprising: a backing board, a stack of a plurality of quantities of product, a plurality of interleaf sheets of a material substantially impermeable to oxygen, at least one of said sheets being positioned between respective adjacent quantities of product in said stack, so that said quantities of product and said sheets are disposed alternately in said stack, said interleaf sheets being secured to said backing board by a manually releasable seal that extends completely around the periphery thereof to enclose each product quantity in a sealed substantially oxygen free compartment, said seal being sufficiently strong that said product can be dispensed by manually rupturing the releasable seal and removing a number of interleaf sheets corresponding to the desired number of quantities of product, while the remaining quantities of product are residually contained in sealed compartments provided by the remaining sealed interleaf sheets.

13. A method of forming a hermetically sealed package of individually sealed compartments, which comprises: positioning a backing board which is adapted to receive a stack of a



plurality of quantities of product, placing a quantity of product on said backing board, positioning a first interleaf sheet in face-to-face juxtaposition to said quantity of product such that said interleaf sheet extends beyond the edge of said quantity of product, securing said interleaf sheet to said backing board by a manually releasable seal that extends along a continuous seal outwardly of the edges of the quantity of product to thereby encapsulate said piece of product in a sealed substantially oxygen free compartment, and repeating the steps of placing a piece of product, positioning an interleaf sheet, and securing said interleaf sheet, until the package contains the desired amount of quantities of product encapsulated in substantially oxygen free compartments, said securing steps being performed by imparting sufficient strength to the seals that product may be dispensed by manually rupturing the releasable seals and removing a number of interleaf sheets corresponding to the desired number of quantities of product, while the remaining quantities of product are residually contained in sealed compartments provided by the remaining sealed interleaf sheets.

4,069,349
PROCESS FOR VACUUM PACKAGING OF ROASTED, GROUND COFFEE

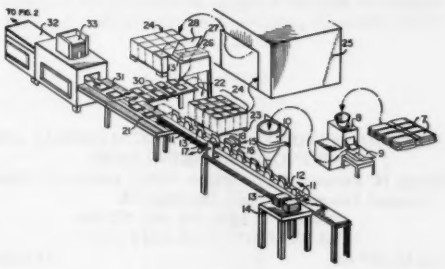
Fred B. Shaw, Hinsdale, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Continuation of Ser. No. 48,953, June 22, 1970, abandoned, which is a continuation of Ser. No. 555,123, June 3, 1966, abandoned. This application July 2, 1973, Ser. No. 375,648

Int. Cl.[2] B65B *9/00;* **B31B** *31/02*

U.S. Cl. 426—395 **5 Claims**

1. A process of packaging a solid gas-evolving product comprising the steps of providing a plurality of pouches, filling the pouches with said gas-evolving product, transferring the filled pouches to a storage chamber containing oxygen at atmospheric conditions of temperature and pressure, storing the filled pouches in the storage chamber for a predetermined length of time at such conditions and within said oxygen containing atmosphere such that the product is in fluid communication with the surrounding medium until substantially all of the gas capable of evolving from the product has evacuated the pouches, removing the pouches from the storage chamber, thereafter completely hermetically sealing the pouches against oxygen containing atmosphere, said pouch filling step is immediately followed by a partial sealing step for partially sealing each pouch mouth by forming a heat-seal in each pouch mouth while leaving a relatively small tortuous passage for the escape of gas from said gas-evolving product, and each tortuous passage is completely sealed during the performance of said hermetically sealing step.



4,069,350
ANIMAL FEED COMPOSITION FROM WATER HYACINTH PLANT

Godofredo G. Monsod, Jr., 11 Scout Bayoran Street, Quezon City, Philippines

Filed July 13, 1976, Ser. No. 704,953

Int. Cl.[2] A23K *1/00*

U.S. Cl. 426—635 **11 Claims**

1. An animal feed composition consisting essentially of water hyacinth meal derived from the leaves and roots which have been separated from the stems and hyacinth leaf protein concentrate, the water hyacinth meal and concentrate content of the composition being in a major amount and minor amounts of corn meal, fish meal, molasses, bone meal, shell and salt.

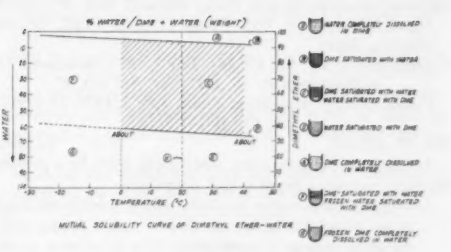
4,069,351
EXTRACTING FOODS WITH A DIMETHYL ETHER-WATER MIXTURE

Nobumitsu Yano; Itaru Fukinbara, both of Tokyo, and Mitsuo Takano, Sakai, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 491,228, July 24, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,573

Int. Cl.[2] A23L *1/22, 1/221, 1/222*

U.S. Cl. 426—650 **14 Claims**



1. A method for obtaining a mixture containing hydrophilic and lipophilic flavor and odor producing components of food substrates which comprises extracting said foods with a liquid dimethyl ether-water extract mixture, free of solid phase dimethyl ether or water, at a temperature of from about −25° C to 40° C, and thereafter separating the extraction residue and removing at least the dimethyl ether portion of the extraction mixture by evaporation; the weight ratio of dimethyl ether to substrate being from 1:1 to 5:1, the weight ratio of water to dimethyl ether in the extraction mixture being such that in the

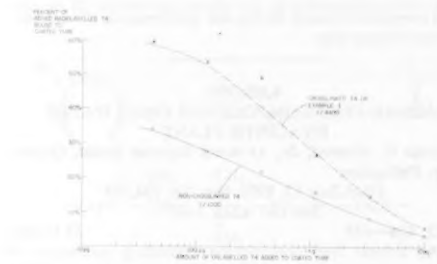
phase diagram of the system shown in FIG. 2 hereof, the amounts of each component are defined as a point in the area C or as a point located along the line B.

4,069,352

IMMUNOADSORBENT POLYMERIC MATERIAL AND METHOD OF MAKING SAME

George H. Parsons, Jr., Arlington, Mass., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 2, 1976, Ser. No. 702,298
Int. Cl.[2] G01N *33/16*; G01T *1/16*
U.S. Cl. 427—2 21 Claims



1. A method of making a solid immunoadsorbent for use in immunoassay procedures which comprises cross-linking the gamma globulin content of low titer antiserum, and bringing the cross-linked gamma globulin at pH 8 to 10 into contact with a surface of a solid polymeric material capable of adsorbing gamma globulin to form a coating of cross-linked gamma globulin adsorbed on said surface.

4,069,353

PROCESS FOR PRODUCING DEVELOPER SHEET FOR PRESSURE-SENSITIVE RECORDING PAPER

Hiroharu Matsukawa, and Takao Hayashi, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 159,567, July 2, 1971, abandoned. This application Sept. 16, 1975, Ser. No. 613,787
Claims priority, application Japan, July 2, 1970, 45-57910
Int. Cl.[2] B41M *5/16*
U.S. Cl. 427—57 12 Claims

1. A process for producing a developer sheet for a pressure-sensitive recording paper which comprises:

forming an oil-in-water emulsion which consists essentially of an oil-soluble color developer which reacts with a colorless organic compound to form a colored product selected from the group consisting of novolactype phenol resins and phenol acetylene resins, a water-immiscible organic solvent for said oil-soluble color developer, water and at least one member selected from the group consisting of an emulsifier and a protective colloid, by adding said member to water and thereafter adding thereto and emulsifying therein a solution of said color developer in said organic solvent;

coating the resulting oil-in-water emulsion on or incorporating the resulting oil-in-water emulsion in a support; and

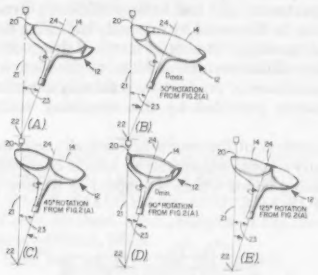
drying to form said developer sheet.

4,069,354

METHOD FOR DISPENSING CEMENT ONTO THE SEAL LAND OF A COLOR CRT FUNNEL

Raymond J. Pekosh, Niles, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 15, 1975, Ser. No. 640,802
Int. Cl.[2] C03C *17/00*, *17/04*
U.S. Cl. 427—64 4 Claims



1. In the manufacture of a color cathode ray tube including a faceplate and a mating funnel, the funnel having a seal land defining a convex curved plane, with at least a curved segment of said funnel seal land lying on a predetermined radius, a method for dispensing a cement onto said segment of the seal land of the funnel, comprising:

holding the funnel such that a section of said seal land segment is substantially horizontal and upwardly facing for preventing cement run-off;

providing a substantially stationary cement dispensing nozzle in position over said substantially horizontal section of said seal land segment for applying cement to said seal land; and

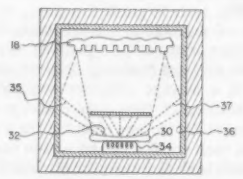
in order to dispense cement on the entirety of said segment, swinging the funnel about an origin of said radius of said seal land segment of the funnel such that said segment passes under the cement dispensing nozzle at a substantially constant predetermined distance beneath the nozzle and in a substantially horizontal attitude.

4,069,355

PROCESS OF MAKING STRUCTURED X-RAY PHOSPHOR SCREEN

Stanley J. Lubowski, Scotia, and Robert K. Swank, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 571,950, April 28, 1975, Pat. No. 4,011,454. This application Aug. 20, 1976, Ser. No. 716,089
Int. Cl.[2] H01J *1/62*
U.S. Cl. 427—70 15 Claims



1. A method for making an improved phosphor screen of the type which absorbs one type of radiation and re-emits a different type of radiation, comprising the steps of:

patterning a generally planar substrate so as to form a large plurality of relatively raised portions, each separated by a

relatively recessed portion, throughout a substantial area of said substrate;

vapor depositing a phosphor material on said patterned substrate at substantial angles relative to the normal to said substrate so that only said raised portions are covered by a substantial thickness of said phosphor material and said recessed portions receive substantially none, thereby yielding a phosphor layer comprising columns of phosphor material substantially separated from each other; and

heat annealing said column-type phosphor screen so as to cause the phosphor material thereof to become substantially transparent by substantially eliminating any small bubbles which could otherwise cause radiation scattering within the material,

whereby a phosphor screen including a series of spaced substantially transparent columns of the phosphor material is formed.

4,069,356

METHOD FOR RAPIDLY FORMING PHOTOCONDUCTIVE LAYERS FOR INTEGRATED CIRCUITS

Albert G. Fischer, Dortmund-Hombruch, Germany, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 499,686, Aug. 22, 1974, abandoned.
This application Dec. 22, 1975, Ser. No. 643,276
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—76 6 Claims

1. A method of making a photoconductive layer for a semiconductor device comprising the steps of:

A. mixing at least one powder of a photoconductive material selected from the group consisting of zinc sulfide (ZnS), cadmium sulfide (CdS), cadmium selenide (CdSe), and cadium telluride (CdTe), with a copper halide powder, where the copper halide powder is between about 0.1 and 5.0% by weight of the total mixture;

B. forming at least one cohesive pellet from the powdered mixture;

C. disposing at least one said pellet of said powdered mixture along with a semiconductor substrate prepared for vapor deposition thereon in spaced relationship in a partial vacuum;

D. evaporating material from said pellet to form a vapor and depositing said vapor on the semiconductor substrate at a rate greater than about 10 nanometers per minute to form a photoconductive layer on the semiconductor substrate, said photoconductive layer comprising at least one composition selected from the group consisting of zinc sulfide (ZnS), cadmium sulfide (CdS), cadmium selenide (CdSe), cadmium telluride (CdTe), zinc sulfide selenide (ZnS_xSe_{1-x}), cadmium sulfide selenide (CdS_xSe_{1-x}), and cadmium sulfide telluride (CdS_xTe_{1-x}) wherein x is greater than zero and less than one; and

E. baking the photoconductive layer and substrate in an oxygen-rich atmosphere at a temperature between 300° and 550° C for about 1 to 2 minutes.

4,069,357

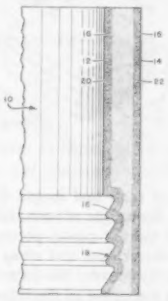
PROCESS FOR DIFFUSING METALLIC COATINGS INTO CERAMICS TO IMPROVE THEIR VOLTAGE WITHSTANDING CAPABILITIES

H. Craig Miller, Clearwater, and Herbert F. Zuhr, St. Petersburg, both of Fla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 9, 1976, Ser. No. 740,339
Int. Cl.[2] H01B *17/42, 17/64, 17/50*
U.S. Cl. 427—123 6 Claims

1. A method for penetratingly covering an alumina ceramic insulator with metal so that the metal is diffused into the surface of the insulator a preselected amount, the method comprising:

coating the insulator with a mixture comprising manganese powder and titanium powder, the manganese and titanium powder mixture ranging from about two parts by metal weight of manganese and five parts by metal weight of titanium to about seven parts by metal weight of manganese and one part by metal weight of titanium, the manganese and titanium together constituting essentially 100%



of the metal present in the mixture; and firing the coated insulator for about 30 to about 90 minutes in about one atmosphere of wet hydrogen at a temperature of from about 1450° to about 1520° C to cause the mixture to penetrate into the ceramic from a depth of from about one tenth millimeter to about three millimeters.

4,069,358

METHOD FOR CLADDING HEAVY GAGE PLATE

Joseph Winter, New Haven, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 28, 1976, Ser. No. 653,094
Int. Cl.[2] C23C *1/10*
U.S. Cl. 427—319 13 Claims

1. A method of cladding plate comprising the steps of:

a. providing a clean, smooth metal substrate in plate form having a thickness of from $\frac{1}{2}$ to 2 inches selected from the group consisting of iron and iron alloys;

b. heating the plate to a temperature between 200° and 1000° C;

c. providing a bath of molten metal cladding material selected from the group consisting of copper and copper base alloys at a temperature above that of the heated substrate plate, wherein the temperature of said metal cladding material ranges from 1100° to 1400° C;

d. forming a standing wave of the molten metal in the bath;

e. contacting at least one surface of the heated substrate plate with the top portion of the standing wave of molten cladding material in at least one pass through the contacting station to form a composite clad plate wherein the cladding thickness ranges from 0.01 to 0.5 inch, wherein the substrate plate contacts the standing wave of cladding material at a speed ranging from 2 to 40 inches per minute; and

f. removing the composite clad plate from the contacting station, to be subsequently formed if desired.

4,069,359

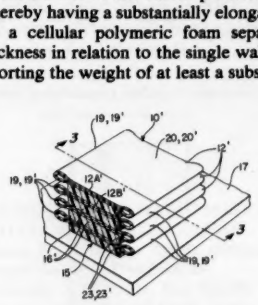
MEANS AND METHOD OF SEPARATING LENGTHS OF FLATTENED FLEXIBLE POLYMERIC TUBE

Ernest W. DeMarse, Tallmadge, and Michael M. Gozdiff, North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 14, 1976, Ser. No. 696,164
Int. Cl.[2] B65D *85/62, 85/67, 81/02*
U.S. Cl. 428—36 30 Claims

1. In combination with a plurality of lengths of at least one flattened flexible polymeric tube disposed in superposed relation, each said length in cross-section including enlarged

folded edge portions with a flat center portion therebetween each length thereby having a substantially elongated dumbbell configuration, a cellular polymeric foam separator having substantial thickness in relation to the single wall thickness of the tube, supporting the weight of at least a substantial part of



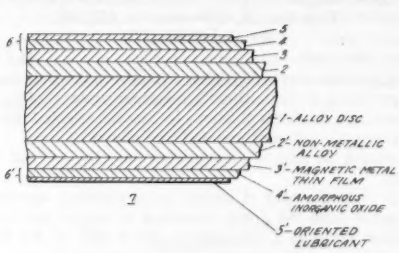
the center portion of each said length to provide a bearing surface to distribute the weight of each said length over at least a substantial part of the flat center portion of the length disposed immediately therebelow and away from the edge portions thereof to thereby prevent the formation of edge creases longitudinally along the edges of the tube lengths.

4,069,360

MAGNETIC RECORD MEMBER AND PROCESS FOR MANUFACTURING THE SAME

Masahiro Yanagisawa, and Yoji Suganuma, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Oct. 22, 1976, Ser. No. 734,962
Claims priority, application Japan, Oct. 31, 1975, 50-132005
Int. Cl.[2] G11B *5/74;* B32B *3/02;* B05D *5/12*
U.S. Cl. 428—64 **23 Claims**



1. A magnetic record member, comprising:
an alloy disc having a slightly topographical surface of not more than 50 microns in the circumferential direction and not more than 10 microns in the radial direction of said disc;
a non-magnetic alloy layer coated on said surface of said alloy disc, said alloy having a surface polished to a mirror finish;
a magnetic metal thin film medium coated on said polished surface of said non-magnetic alloy layer;
an amorphous inorganic oxide layer coated on said medium;
a silicon containing lubricant layer coated on said surface of said oxide layer and oriented so as to adhere to said oxide layer.

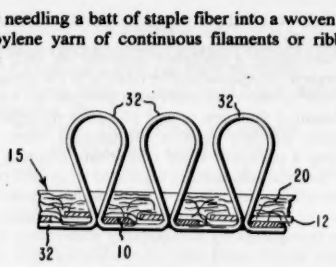
4,069,361

WOVEN CARPET BACKING WITH FUSED STAPLE FIBER NEEDLED LAYER

Vijayendra Kumar, New Castle, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 20, 1975, Ser. No. 606,007
Int. Cl.[2] B32B *3/02*
U.S. Cl. 428—95 **6 Claims**

1. An improved shear-resistant backing for pile fabrics prepared by needling a batt of staple fiber into a woven fabric of polypropylene yarn of continuous filaments or ribbons and



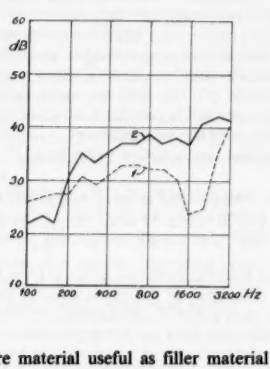
then bonding the structure by fusion of the staple fiber of the batt.

4,069,362

CORE MATERIAL FOR BUILDING ELEMENTS OF SANDWICH TYPE

Jorgen Flemming Ravnkilde, Hornbaek, and Ivar Ostrup, Farum, both of Denmark, assignors to Rockwool International A/S, Hedehusene, Denmark

Filed Oct. 7, 1976, Ser. No. 730,497
Claims priority, application Denmark, Oct. 14, 1975, 4598/75
Int. Cl.[2] B32B *3/02*
U.S. Cl. 428—194 **1 Claim**



1. In core material useful as filler material between outer boards in sandwich-type building elements for walling or bulkheads, said core material being used to fill interspace between the outer boards of said sandwich-type building elements, the improvement which comprises utilizing as the core material at least two separate layers of bonded mineral wool with surfaces that face and touch each other but are only connected to each other by gluing along edges of said surfaces wherein said separate layers of bonded mineral wool have different thicknesses.

4,069,363

CRIMPABLE NYLON BICOMPONENT FILAMENT AND FABRICS MADE THEREFROM

William Benjamin Segraves, Martinsville, Va., and Kenneth Lee Mulholland, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 581,158, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 493,393, July 31, 1974, abandoned. This application July 6, 1976, Ser. No. 702,446
Int. Cl.[2] D02G *3/00;* D04B *11/00;* D04H *1/00*
U.S. Cl. 428—224 **12 Claims**

1. A fabric comprising yarn of non-precrimped nylon filament consisting essentially of two, continuous, adherent, eccentric components, one component being a sheath consisting essentially of a homopolymer selected from the group consist-

ing essentially of polyhexamethylene dodecanedioamide, polyhexamethylene adipamide, and poly-ε-caproamide, the other component being a core consisting essentially of a random

copolymer of hexamethylene dodecanediomamide and ε-caproamide units, said copolymer consisting about 25–45% by weight of ε-caproamide units, said yarn being made into said fabric without precrimping and is thereafter crimped.

4,069,364

RADIATION POLYMERIZED COATED ARTICLE AND METHOD OF MAKING SAME

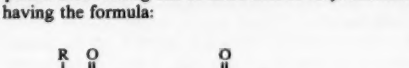
Ray A. Dickie, Birmingham, and Joseph C. Cassatta, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 537,736, Dec. 31, 1974, Pat. No. 3,957,918. This application Dec. 22, 1975, Ser. No. 643,425

Int. Cl.[2] **B32B** *15/08, 27/30, 31/28;* **B05D** *3/06*

U.S. Cl. 428—276 **19 Claims**

1. An article of manufacture comprising a substrate and an adherent layer of a radiation polymerized paint on the surface thereof, said paint, on a non-polymerizable solvent, pigment, initiator and particulate filler-free basis, consisting essentially of the in situ formed polymerization product of a film-forming solution of: (1) betwween about 90 and about 10 parts of a saturated, thermoplastic vinyl polymer having a number average molecular weight ranging from about 2,000 to about 250,000 and being prepared from at least about 85 weight percent of monofunctional vinyl monomers; (2) between about 10 and about 90 parts of vinyl monomer solvent for said polymer up to 90 weight percent of said solvent being monovinyl monomers with the remainder being selected from the group consisting of divinyl monomers, trivinyl monomers, tetravinyl monomers and mixtures thereof; and (3) between about 1.0 and about 15.0 parts per 100 parts of the total of said thermoplastic vinyl polymer and said vinyl solvent monomers of a triester of phosphoric acid bearing one or more sites of vinyl unsaturation and having the formula:



$$[H_2C{=}\underset{\displaystyle R}{\underset{|}{C}}{-}\overset{\displaystyle O}{\overset{\|}{C}}{-}O{-}A{-}O]_m{-}\overset{\displaystyle O}{\overset{\|}{P}}[OR']_{3-m} \qquad m=1,\ 2 \text{ or } 3$$

where:

R = H, Cl, CH_3

A = C_nH_{2n}, $2 \leqq n \leqq 6$

R′ = C_1 to C_6 alkyl or C_1 to C_4 chloro- or bromoalkyl.

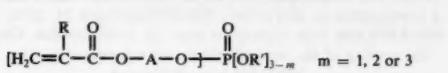
5. A process for making an abrasion and corrosion resistant plural coated article comprising:

A. Coating of surface of a substrate with a base coat composition;

B. Curing the base coat composition to form a film;

C. Vapor depositing a layer of metal on the surface of said base coat composition film;

D. Coating the metal bearing surface with a top coat composition which, exclusive of non-polymerizable solvents, pigments, initiators and other non-reactive components, consists essentially of: (1) between about 90 and about 10 parts of a saturated, thermoplastic, vinyl polymer prepared from at least about 85 weight percent of monofunctional vinyl monomers; (2) between about 10 and about 90 parts of vinyl solvent monomers for said vinyl polymer, at least about 10 weight percent of said solvent monomers being selected from the group consisting of divinyl monomers, trivinyl monomers, tetravinyl monomers and mixtures thereof; and (3) between about 1.0 and about 15.0 parts per 100 parts of the total of said thermoplastic vinyl polymer and said vinyl solvent monomers of a mono- or diester of phosphoric acid bearing one or more sites of vinyl unsaturation an having the formula:



$$[H_2C{=}\underset{\displaystyle R}{\underset{|}{C}}{-}\overset{\displaystyle O}{\overset{\|}{C}}{-}O{-}A{-}O{\rightarrow}\overset{\displaystyle O}{\overset{\|}{P}}[OR']_{3-m} \qquad m=1,\ 2 \text{ or } 3$$

where:

R = H, Cl or CH_3

A = C_nH_{2n}, $2 \leqq n \leqq 6$

R′ = C_1 to C_4 chloro- or bromo- alkyl or C_1 to C_4 alkyl

E. Curing the top coat composition to form a film by exposure to radiation.

4,069,365

CATIONIC VINYL PYRIDINE COPOLYMERS AND PRODUCTS THEREOF

Alan Rembaum, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 102,239, Dec. 28, 1970, Pat. No. 3,754,055, which is a continuation-in-part of Ser. No. 763,938, Sept. 30, 1968, abandoned. This application June 26, 1973, Ser. No. 373,616

Int. Cl.[2] **B32B** *27/00;* **D02G** *3/00;* **B32B** *21/04, 21/06*

U.S. Cl. 428—262 **8 Claims**

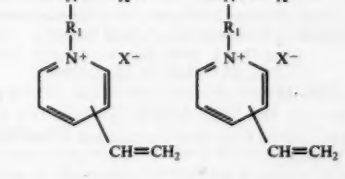
1. A coated article comprising:

an inert substrate having coated thereon:

a polyquaternary, water-insoluble, water-swellable, cross-linked polymer of vinyl pyridine and a dihalo organic compound of the formula:

$$X{-}R_1{-}X$$

where X is halo selected from the group consisting of bromo, chloro and iodo and R_1 is a divalent organic radical containing 1–20 carbon atoms and being selected from the group consisting of alkylene, alkenylene, alkynylene, arylene, alkarylene and aralkylene; said polymer containing a plurality of structural units of the formula:

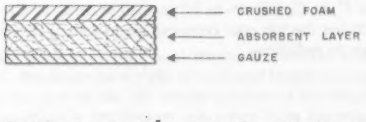


the ratio of X^- to N^+ atoms being essentially stoichiometric, the polymer containing residual unsaturation capable of further reaction and the polymer undergoing a reversible color change above and below a pH of 7.

4,069,366
PERMEABLE POLYMERIC LINER ON ABSORBENT PADS

Charles E. Hoey, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 562,271, March 26, 1975, which is a division of Ser. No. 394,601, Sept. 5, 1973, Pat. No. 3,901,240, which is a continuation-in-part of Ser. No. 354,062, April 24, 1973, Pat. No. 3,887,408. This application Sept. 24, 1976, Ser. No. 726,716
The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—310 7 Claims



2. A flexible, absorbent pad comprising a top layer of polymeric foam material permeable to liquids, an underlying layer of liquid-absorbent material, and a bottom layer of a woven or non-woven gauze, wherein said polymeric foam material is crushed foam of an addition polymer comprising an acrylic monomer, the thickness of the crushed layer being from about 1 mil to about 10 mils and the pore size being less than about 10 mils with approximately 100,000 to 1,000,000 pores per square inch.

4,069,367
MAGNETIC POWDER MATERIAL COMPRISING IRON OXIDE PARTICLES WITH A COPPER-COBALT ALLOY COATING

Shinji Umeki, Saku; Kazuhide Aue, Chiba, and Yasumichi Tokuoka, Saku, all of Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Jan. 12, 1973, Ser. No. 323,293
Claims priority, application Japan, Jan. 13, 1972, 47-6040
Int. Cl.[2] H01F *1/02;* C04B *35/00;* C22B *1/04*
U.S. Cl. 428—403 6 Claims

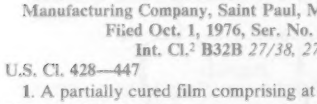
1. A magnetic powder material comprising magnetic iron oxide particles having a substantially uniform coating of an alloy consisting essentially of Co and Cu, said alloy being deposited on said iron oxide particles in an amount sufficient to provide high coercivity, high magnetic flux density and low electrical resistance, the amount of Co in said alloy being about 3 wt% with respect to the weight of said iron oxide particles and said amount of Cu in said alloy being about 0.4 wt% with respect to the weight of said iron oxide particles.

4,069,368
WORKABLE AND CURABLE EPOXY-TERMINATED SILANE FILMS

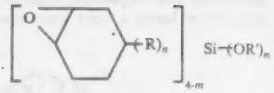
Frank L. Deyak, Stillwater, and Arthur A. Wegwerth, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 1, 1976, Ser. No. 728,859
Int. Cl.[2] B32B *27/38, 27/08*
U.S. Cl. 428—447 10 Claims

1. A partially cured film comprising at least 15% by weight of material derived from epoxy-terminated silanes represented by the formulae:



-continued



wherein, each R is independently a non-hydrolyzable divalent hydrocarbon radical of less than 20 carbon atoms, or a divalent radical of less than 20 carbon atoms the backbone of which is C atoms which may be interrupted by individual atoms from the group of N and O, the O atoms in the form of either linkages,

m is 1, 2, or 3,

n is 0, or 1, and

R′ is aiphatic hydrocarbon radical of less than 10 carbon atoms, an acyl radical of less than 10 carbon atoms, or a radical of the formula $(CH_2CH_2O)_kZ$ in which *k* is an integer of at least 1, and Z is hydrogen or an aliphatic hydrocarbon radical of less than 10 carbon atoms,

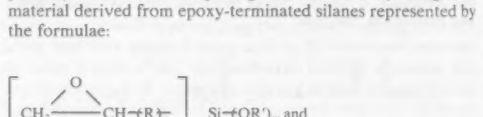
said film cured to a degree such that visually observable dichloromethane attack occurs in not less than 15 seconds and no more than seven-and-one-half minutes when

1. a 4.25 cm diameter circle of filter paper is placed on the film,
2. the paper is wetted thoroughly with dichloromethane,
3. a clear plastic cover is placed over the wetted paper, and
4. the time for visually observable attack on the coating is measured,

said partially cured film further characterized by having

1. a latent catalyst within the film in sufficient amount so that when delatentized the film will cure to a degree so that the partially cured film will not be attacked by dichloromethane under the above conditions within 10 minutes, or
2. a thermoplastic polymer layer directly bonded thereto, said polymer containing sufficient catalyst therein so that upon heating to a temperature sufficient to allow migration of the catalyst to the partially cured film layer, the partially cured film layer will be cured to a degree sufficient so that the then cured film will not be attacked by dichloromethane under the above conditions within 10 minutes.

9. A method of forming a shaped abrasion resistant coated article which comprises applying heat and pressure to a partially cured film bonded to a moldable thermoplastic resin said partially cured film comprising at least 15% by weight of material derived from epoxy-terminated silanes represented by the formulae:



wherein, each R is independently a non-hydrolyzable divalent hydrocarbon radial of less than 20 carbon atoms, or a divalent radical of less than 20 carbon atoms the backbone of which is C atoms which may be interrupted by individual atoms from the group of N and O, the O atoms in the form of ether linkages,

m is 1, 2, or 3,

n is 0, or 1, and

R′ is an aliphatic hydrocarbon radical of less than 10 carbon atoms, an acyl radical of less than 10 carbon atoms, or a radical of the formula $(CH_2CH_2O)_kZ$ in which *k* is an integer of at least 1, and Z is hydrogen or an aliphatic hydrocarbon radical of less than 10 carbon atoms,

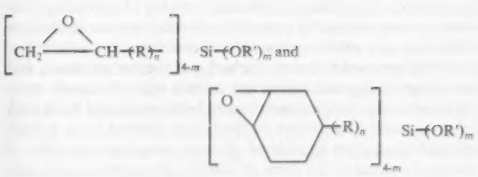
said film cured to a degree such that visually observable di-

chloromethane attack occurs in not less than 15 seconds and no more than seven-and-one-half minutes when

1. a 4.25 cm diameter circle of filter paper is placed on the film,
2. the paper is wetted thoroughly with dichloromethane,
3. a clear plastic cover is placed over the wetted paper, and
4. the time for visually observable attack on the coating is measured,

said partially cured film further characterized by having a latent catalyst within the film in sufficient amount so that when delatentized the film will cure to a degree so that the partially cured film will not be attacked by dichloromethane under the above conditions within 10 minutes and further using means to delatentize said latent catalyst.

10. A method of forming a shaped abrasion resistant coated article which comprises applying heat and pressure to a partially cured film bonded to a moldable thermoplastic resin said partially cured film comprising at least 15% by weight of material derived from epoxy-terminated silanes represented by the formulae:



wherein, each R is independently a non-hydrolyzable divalent hydrocarbon radial of less than 20 carbon atoms, or a divalent radical of less than 20 carbon atoms the backbone of which is C atoms which may be interrupted by individual atoms from the group of N and O, the O atoms in the form of ether linkages,

m is 1, 2, or 3,

n is 0, or 1, and

R′ is an aliphatic hydrocarbon radical of less than 10 carbon atoms, an acyl radical of less than 10 carbon atoms, or a radical of the formula $(CH_2CH_2O)_kZ$ in which k is an integer of at least 1, and Z is hydrogen or an aliphatic hydrocarbon radical of less than 10 carbon atoms, said film cured to a degree such that visually observable dichloromethane attack occurs is not less than 15 seconds and no more than seven-and-one-half minutes when

1. a 4.25 cm diameter circle of filter paper is placed on the film,
2. the paper is wetted thoroughly with dichloromethane,
3. a clear plastic cover is placed over the wetted paper, and
4. the time for visually observable attack on the coating is measured,

said partially cured film further characterized by having a thermoplastic polymer layer directly bonded thereto, said polymer containing sufficient catalyst therein so that upon heating to a temperature sufficient to allow migration of the catalyst to the partially cured film layer, the partially cured layer will be cured to a degree sufficient so that the then cured film will not be attacked by dichloromethane under the above conditions within 10 minutes, said heat and pressure being sufficient to allow the catalyst to migrate to said partially cured layer and cure said epoxy-terminated silane layer to a degree such that it will withstand dichloromethane attack for more than 10 minutes.

4,069,369

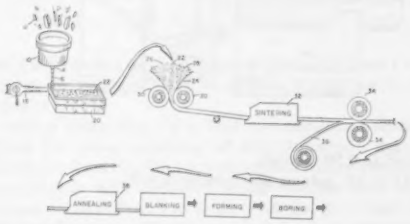
FINE DISPERSION ALUMINUM BASE BEARING

Robert J. Fedor, Westlake, Ohio, and Walter E. Smith, Hingham, Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 98,233, Dec. 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 704,678, Feb. 12, 1968, abandoned. This application May 4, 1973, Ser. No. 357,218

Int. Cl.[2] B22F *7/02, 7/04*

U.S. Cl. 428—557 21 Claims



1. A sintered, coherent, multi-layer powder metal composite comprising a powder metal bonding layer, a powder metal bearing layer strongly bonded to said powder metal bonding layer by a sintered transition zone of compacted, intermingled powder particles of said bearing layer and said bonding layer, and a powder metal sacrificial layer bonded to said powder metal bearing layer by a sintered transition zone of compacted, intermingled powder particles of said bearing layer and said sacrificial layer,

said powder metal bonding layer comprising more than 55 weight percent aluminum and the balance material selected from a first group of additives consisting of silicon, copper, manganese, magnesium, nickel, iron, zinc, chromium, zirconium, titanium and mixtures thereof;

said powder metal bearing layer comprising from 55 to about 95 weight percent aluminum, from 5 to 25 weight percent bearing phase material selected from a second group of additives consisting of lead, tin, cadmium, bismuth, antimony and mixtures thereof, and from 0 to about 20 weight percent material selected from said first group of additives, at least all of said aluminum and said bearing phase material of said bearing layer being in pre-alloyed particle form with said bearing phase material dispersed in an intra-particle position relative to said aluminum;

said powder metal sacrificial layer comprising intermixed aluminum particles and bearing phase particles, more than 50 weight percent of said particles comprising aluminum particles and the balance of said particles being selected from said first and second groups of additives, the bearing phase material of said sacrificial layer having an interstitial position relative to said aluminum particles.

4,069,370

ELECTRICAL CONTACT MATERIAL, AND TERMINAL

Nils Harmsen, Bruchkobel, and Franz Sperner, Hanau, both of Germany, assignors to W. C. Heraeus GmbH, Hanau (Main), Germany

Filed July 16, 1976, Ser. No. 705,918

Claims priority, application Germany, Sept. 13, 1975, 2540956

Int. Cl.[2] B32B *15/00, 15/04*

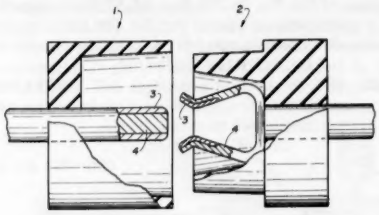
U.S. Cl. 428—671 2 Claims

1. Electrical terminal, particularly for plug or wiping terminals for use in electronics, comprising a carrier of electrical contact terminal material at least partially coated with a contact material consisting essentially of

20 to 30% palladium,

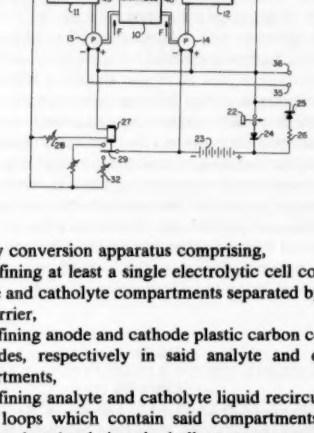
15 to 25% silver,

2.5 to 5% tin,
0.05 to 0.5% iridium,
0.05 to 0.5% ruthenium,



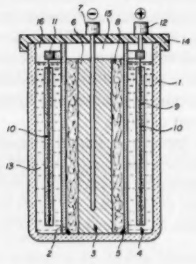
0.05 to 0.5% copper,
0.1 to 2% indium, and remainder gold.

4,069,371
ENERGY CONVERSION
Ralph Zito, Durham, N.C., assignor to GEL, Inc., Durham, N.C.
Filed May 10, 1976, Ser. No. 678,638
Int. Cl.² H01M 8/18
U.S. Cl. 429—21 **13 Claims**



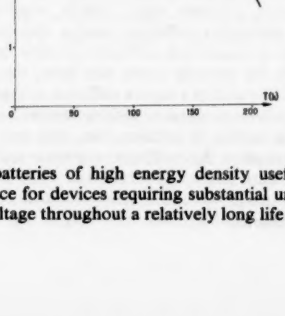
1. Energy conversion apparatus comprising,
means defining at least a single electrolytic cell comprising anolyte and catholyte compartments separated by a diffusion barrier,
means defining anode and cathode plastic carbon composite electrodes, respectively in said analyte and catholyte compartments,
means defining analyte and catholyte liquid recirculating in closed loops which contain said compartments respectively, and recirculating the bulk storage means for said fluids, the fluids being solutions of metal salt which plate out metal on the anode during application of charging potential to the electrodes and deplate metal and redissolve it into the anolyte during discharge of the system and which change valence states within the catholyte without plating,
electrolytic means for maintaining catholyte molarity between 2.0 and 4.0,
means for preventing oxidation of the plating/deplating metal to combat polarization and maintain reversibility over extended charge/discharge cycling.

4,069,372
ELECTRIC ACCUMULATOR WITH A SOLID ELECTROLYTE
Michel Voinov, Geneva, Switzerland, assignor to Battelle Development Corporation, Columbus, Ohio
Filed Nov. 30, 1976, Ser. No. 746,108
Int. Cl.² H01M 6/30
U.S. Cl. 429—104 **16 Claims**



1. In an electric accumulator comprising an anode compartment containing an anode formed from at least one metal selected from the group consisting of metals belonging to Groups I*a*, II*a*, II*b* and III*b* of the periodic table of elements; a cathode compartment containing a cathode formed a conducting member comprising a substance capable of accepting electrons, to form anions by cathodic reduction, and an electrolyte consisting of a substance capable of dissolving the product or products generated during discharge of the accumulator, said electrolyte being maintained in a molten state; the anode compartment and cathode compartment being separated from each other by wall impervious to fluids and formed from a solid mineral electrolyte capable of allowing selective migration of the anode metal in the form of cations; the improvement consisting in that the anode compartment contains a porous matrix adjacent said anode and at least one salt of the anode metal capable of allowing migration of this metal in the form of cations, said salt being maintained in a molten state and permeating said porous matrix, with said salt and said matrix being interposed between the anode and said separation wall.

4,069,373
POSITIVE ACTIVE MATERIAL FOR PRIMARY BATTERIES HAVING HIGH ENERGY DENSITY
Jean-Paul Gabano, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France
Filed Aug. 31, 1976, Ser. No. 719,113
Claims priority, application France, Sept. 15, 1975, 75 28230
Int. Cl.² H01M 6/14
U.S. Cl. 429—194 **10 Claims**



1. Primary batteries of high energy density useful as an energizing source for devices requiring substantial uniformity of discharge voltage throughout a relatively long life compris-

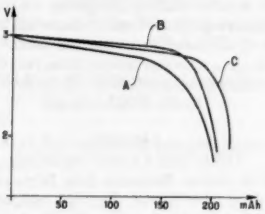
ing a negative electrode constituted by lithium, an electrolyte solution comprising an organic solvent having dissolved therein an ion-forming salt and a positive electrode comprising positive active material constituted by a metal salt whose cation is monovalent silver and where complex anion is selected from the group consisting of silver ferrocyanide and silver ferricyanide.

4,069,374

HIGH ENERGY DENSITY ELECTRIC CELLS

Jean-Paul Gabano, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Feb. 16, 1977, Ser. No. 769,343
Claims priority, application France, Mar. 9, 1976, 76 06706
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—197 **9 Claims**



1. An electric cell having lithium as its negative active material, a silver salt or silver oxide as its positive active material and a solution comprising one solute and at least two solvents as its electrolyte, the first of the solvents being selected from the group consisting of carbonate and sulphate esters, and the second solvent of the electrolyte being an aromatic hydrocarbon selected from the group, consisting of benzene and its substituted derivatives.

4,069,375

MANUFACTURE OF GALVANIC ELEMENTS HAVING LITHIUM OR CALCIUM ELECTRODES

Helmut Lauck, Glashutten, Germany, assignor to Varta Batterie Aktiengesellschaft

Filed Sept. 10, 1976, Ser. No. 722,112
Claims priority, application Germany, Oct. 17, 1975, 2546585
Int. Cl.[2] H01M *4/58*
U.S. Cl. 429—218 **12 Claims**

1. A method of manufacturing electrodes of lithium or calcium metal for galvanic elements, comprising the steps of

immersing the electrode metal in an atmosphere of gas which reacts with the electrode metal to form upon the metal surface a thin, continuous, non-hygroscopic covering layer, and

thereafter using the metal in an electrode.

8. The electrode made by the method of claim 1.

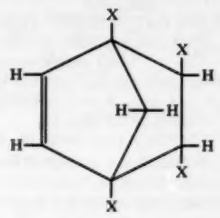
4,069,376

PROCESS FOR SUBSTANTIALLY GEL-FREE POLYMERIZATION OF NORBORNENE WITH DICYCLOPENTADIENE

Robert J. Minchak, Parma Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 17, 1975, Ser. No. 568,898
The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.
Int. Cl.[2] C08F *4/44, 32/08, 232/08, 236/00*
U.S. Cl. 526—137 **8 Claims**

1. A process comprising polymerization of a norbornene-type monomer with about 0% to about 95% by weight of dicyclopentadiene, based upon total polymer weight, said norbornene-type monomer having the formula



where X is hydrogen or an alkyl group containing from 1 to 6 carbon atoms, said polymerization being conducted in the presence of

1. catalyst comprising (a) at least one compound selected from the group consisting of dialkylaluminum iodides, alkylaluminum diiodides and mixtures of trialkylaluminum compounds with elemental iodine wherein each alkyl group contains from 2 to 8 carbon atoms, (b) at least one dialkylaluminum chloride or alkylaluminum dichloride wherein each alkyl group contains from 2 to 8 carbon atoms and (c) at least one tungsten compound soluble in the monomer mixture or in a solvent selected from the group consisting of aliphatic and cycloaliphatic hydrocarbon solvents containing 4 to 10 carbon atoms and liquid or easily liquified aromatic hydrocarbon solvents containing 6 to 14 carbon atoms, wherein the molar ratio of said (a) to said (b) is from about 0.1/1 to about 10/1, the catalytically effective amount of the combined total of said (a) and (b) is from about 0.25 to about 10 millimoles per mole of monomer, said (a) and (b) are charged before said (c), the molar ratio of the combined total of (a) and (b) to (c) is from about 1/1 to about 80/1 moles per mole, and the molar ratio of said elemental iodine to said trialkylaluminum compound is from about 0.25/1 to about 6/1 moles per mole, and
2. at least one nonconjugated acyclic olefin containing from 2 to 12 carbon atoms and having at least one hydrogen on each double-bonded carbon atoms, said acyclic olefin being used in a molar ratio to monomer from about 0.0001/1 to about 0.3/1 mole per mole.

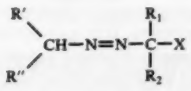
4,069,377

POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS EMPLOYING SECONDARY-ALIPHATIC α-SUBSTITUTED AZOALKANES

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation

Division of Ser. No. 453,447, March 21, 1974, Pat. No. 4,025,502. This application June 14, 1976, Ser. No. 695,495
Int. Cl.[2] C08F *4/04, 12/02, 112/02*
U.S. Cl. 526—218 **8 Claims**

1. A process which comprises polymerizing ethylenically unsaturated monomer in the presence of an initiating amount of a compound of the formula



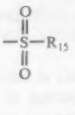
where:

R′ and R″ are separately selected from alkyl of 1–12 carbons, cycloalkyl of 3–12 carbons, and aralkyl of 7–12 carbons, or join to form cycloalkyl of 3–12 carbons, and R″ is further selected from aryl of 6–14 carbons;

R_1 and R_2 are separately selected from alkyl of 1–8 carbons, cycloalkyl of 3–12 carbons and aralkyl of 7–12 carbons or

join to form cycloalkyl of 4–12 carbons, and R_2 is further selected from aryl of 6–14 carbons;

X is selected from —Cl, —Br, —CN, —C(=O)NH_2, —C(=NOH)NH_2, —OH, —OR_3, —OC(=O)OR_3, —OOR_5, —SR_6, —N_3, —SCN, —NCX′, —NHC(=X′)OR_3, —NHC(=X′)N(R_8)R_9, —NHC(=X′)NHNHC(=X′)R_4, —NHC(=X′)NHN(R_8)C(=X′)N(R_8)R_9, —NHC(=X′)N(NH_2)R_{10}, —NHC(=X′)NHNHR_{16}, —NHC(=X′)NHN(R′$_8$)R′$_9$, —NHC(=X′)NHNHC(=X′)X′R_3, and



X′ is oxygen or sulfur;

R_3 and R_4 are separately selected from alkyl of 1–12 carbons, cycloalkyl of 3–12 carbons, aralkyl of 7–12 carbons, and aryl of 6–14 carbons, and R_4 is further selected from hydrogen;

R_5 is tertiary alkyl of 4–12 carbons or tertiary phenalkyl of 9–12 carbons;

R_6 is selected from alkyl of 1–12 carbons, cycloalkyl of 3–12 carbons, and aryl of 6–14 carbons;

R_8, R_9, R′$_8$ and R′$_9$ are separately selected from alkyl of 1–8 carbons, cycloalkyl of 3–12 carbons, aralkyl of 7–12 carbons, and aryl of 6–14 carbons or R_8 and R_9 or R′$_8$ and R′$_9$ taken together form alkylene of 3–11 carbons, and R_8 and R_9 are further selected from hydrogen;

R_{10} is primary or secondary alkyl of 1–12 carbons or cycloalkyl of 3–12 carbons;

R_{15} is aryl of 6–10 carbons; and

R_{16} is selected from hydrogen, tertiary alkyl of 4–8 carbons, tertiary aralkyl of 9–12 carbons, and aryl of 6–14 carbons.

4,069,378

SELF-EMULSIFYING ANAEROBIC COMPOSITION

JoAnn DeMarco, Southington, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed June 17, 1976, Ser. No. 697,165
Int. Cl.[2] C08F *20/20*
U.S. Cl. 526—328 14 Claims

1. An anaerobic curing composition which is self-emulsifiable upon mixing with water comprising:

a. an anaerobically curing acrylate monomer;

b. a peroxy initiator in sufficient concentration to initiate cure of the monomer upon exclusion of oxygen; and

c. about 0.25 to about 10.0 percent by weight of the total composition of an anionic or nonionic surfactant which is dissolved in the composition and which renders the composition self-emulsifying upon mixing with water.

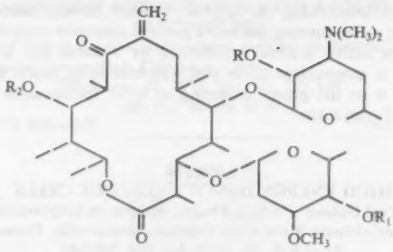
4,069,379

SEMI-SYNTHETIC OLEANDOMYCINS

Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 703,464, July 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 663,467, March 3, 1976, abandoned. This application July 29, 1976, Ser. No. 709,703
Int. Cl.[2] C07H *17/08*
U.S. Cl. 536—9 8 Claims

1. A compound of the formula



and the pharmaceutically acceptable mineral or organic addition salts thereof wherein R is selected from the group consisting of hydrogen, and alkanoyl having from two to three carbon atoms; R_1 is selected from the group consisting of hydrogen alkanoyl having from two to three carbon atoms and tri-(lower-alkyl) silyl; and R_2 is selected from the group consisting of hydrogen, alkanoyl having from two to three carbon atoms, trifluoroacetyl and tri(lower alkyl)silyl.

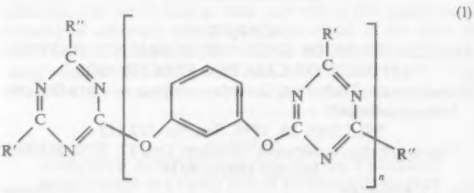
4,069,380

TRIAZINE COMPOSITIONS

David Crawford Eaton; Benjamin Eric Nicholson, and Barry Williams, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

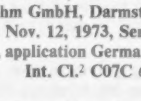
Filed Sept. 3, 1976, Ser. No. 720,392
Claims priority, application United Kingdom, Sept. 24, 1975, 39133/75
Int. Cl.[2] C07D *251/46, 251/52*
U.S. Cl. 544—212 5 Claims

1. A condensation product of cyanuric chloride, resorcinol and ammonia consisting primarily of a compound of the formula



(1)

in which n is 1 or 2; each R′ is independently NH_2 or Cl and each R″ is independently NH_2 or



(2)

provided that a sufficient number of radicals represented by R′ are Cl atoms to provide a chlorine content of at least 3% by weight and at least one of R′ and R″ is NH_2.

4,069,381

METHOD FOR PREPARING GLYCOL ESTERS

Wolfgang Gaenzler, Darmstadt-Eberstadt; Klaus Kabs, Seeheim, and Güenter Schroeder, Ober-Ramstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Nov. 12, 1973, Ser. No. 415,453
Claims priority, application Germany, Nov. 20, 1972, 2256847
Int. Cl.[2] C07C *67/05*
U.S. Cl. 560—1 11 Claims

1. In a method for making glycol monoesters and glycol diesters of a carboxylic acid by reacting an olefin with oxygen

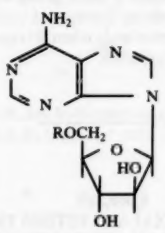
in a reaction medium comprising or consisting essentially of a carboxylic acid in the presence of a catalyst, the improvement wherein said reaction is performed at an elevated pressure, above atmospheric pressure, and wherein said catalyst consists essentially of (A) a compound, soluble in said reaction medium, of a catalytic metal of Groups IVB – VIIB of the Periodic Table having an atomic number between 40 and 42 inclusive or between 72 and 75 inclusive or consists essentially of (B) a catalyst as defined in (A) in combination with the compound, soluble in said reaction medium, of a further metal selected from the group consisting of lithium, sodium, potassium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, aluminum, or silver.

4,069,382
9-(5-O-ACYL-β-D-ARABINOFURANOSYL)ADENINE COMPOUNDS

David Clarkston Baker, and Theodore Herbert Haskell, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed May 17, 1976, Ser. No. 687,272
Int. Cl.² C07H *19/18*
U.S. Cl. 536—26 **9 Claims**

1. A 9-(5-O-acyl-β-D-arabinofuranosyl)adenine compound having the formula



I

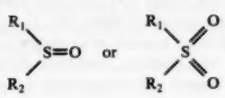
where R is a straight chain alkanoyl group having from 2 to 8 carbon atoms or a branched chain alkanoyl group having 4 to 5 carbon atoms.

4,069,383
METHOD OF PREPARING MELAMINE FROM CYANAMIDE AND/OR DICYANDIAMIDE

Horst Michaud; Günter Ortenburger; Wilhelm Poschinger; Heinrich Röck, and Josef Seeholzer, all of Trostberg, Germany, assignors to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Germany

Filed Aug. 17, 1976, Ser. No. 715,027
Claims priority, application Germany, Aug. 18, 1975, 2536689
Int. Cl.² C07D *251/58*
U.S. Cl. 544—202 **14 Claims**

1. Method of preparing melamine from at least one reactant selected from the group consisting of cyanamide and dicyandiamide by contacting said reactant at approximately atmospheric pressure in an organic solvent at 100° to 250° C, with at least one solvent selected from the group having the formulas



wherein

R_1 and R_2 are alkyl which may be joined together to form an alkylene ring,

in the simultaneous presence of alkali metal hydroxide or alkaline earth hydroxide.

4,069,384
CARBOXYL TERMINATED POLYDIENES

Glen E. Meyer, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 211,124, Dec. 22, 1971, abandoned. This application Nov. 8, 1974, Ser. No. 521,994
Int. Cl.² C07C *67/08*
U.S. Cl. 560—91 **4 Claims**

1. A method of preparing a carboxyl terminated polymer from a hydroxyl terminated polymer which method comprises essentially reacting, at a temperature in the range of about 50° to about 150° C., (I) a cyclic anhydride selected from at least one of maleic, chlorendic, phthalic, nadic methyl, and tetrapropenyl, succinic and succinic anhydride substituted with radicals selected from alkyl and alkylene radicals having 2 to 16 carbon atoms with (II) a hydroxyl terminated polymer having a molecular weight in the range of about 400 to about 30,000 and a viscosity at 30° C. of about 2 to about 10,000 poises selected from at least one of (A) polydienes having a hydroxyl functionality in the range of about 2 to about 4 selected from polymers of 1,3-butadiene or isoprene, and copolymers of 1,3-butadiene or isoprene with styrene or acrylonitrile and (B) polyethers having a hydroxyl functionality in the range of about 1.8 to about 4 selected from polyethylene oxide, polypropylene oxide, copolymers of ethylene oxide and propylene oxide, polytetrahydrofuran, and copolymers of tetrahydrofuran with ethylene oxide or propylene oxide in the presence of (III) a catalyst selected from at least one of (A) quaternary ammonium salts and (B) halogen-acid salts; where the halogen-acid salts of amine are selected from benzylamine hydrobromide, benzylamine hydrochloride, cyclohexylamine hydrochloride, triethylamine hydrochloride, tribenzylamine hydrochloride, tribenzylamine hydrobromide, triethylamine hydrobromide, trimethylamine hydrochloride, trimethylamine hydrobromide, ethylamine hydrochloride and ethylamine hydrobromide, and where the quaternary ammonium salts are selected from:

distearyldimethylammonium chloride,
tetrapentylammonium chloride,
tetraphenylammonium bromide,
trioctylpropylammonium chloride,
trioctylpropylammonium bromide,
cetyldimethylbenzylammonium chloride,
n-alkyldimethylbenzylammonium chloride,
myristyldimethylbenzylammonium chloride,
tetramethylammonium chloride,
tetramethylammonium bromide,
tetraethylammonium chloride,
cetyltrimethylammonium chloride,
laurylpyridinium chloride,
laurylpyridinium bromide,
cetylpyridinium chloride, cetylpyridinium bromide,
n-alkyldimethylnaphthylmethylammonium chloride,
stearyldimethylbenzylammonium chloride,
diisobutylphenoxyethoxyphenyl-dimethylbenzylammonium chloride,
diisobutylcresoxyethoxyethyl-dimethylbenzylammonium chloride.

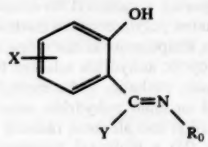
4,069,385
METHOD FOR THE PREPARATION OF OPTICALLY ACTIVE ALLYLIC ESTERS

Masashi Araki, Ibaraki, and Tsuneyuki Nagase, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 3, 1976, Ser. No. 692,510
Claims priority, application Japan, June 3, 1975, 50-67197; June 6, 1975, 50-68843
Int. Cl.² C07C *69/145, 69/24, 69/78*
U.S. Cl. 560—106 **9 Claims**

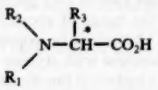
1. In the preparation of olefin derivatives having an ester group at the allylic position which comprises reacting an olefin having at least one hydrogen atom at the allylic position and

which will produce an allylic ester having an asymmetric carbon atom with an organic peroxide in the presence of a copper catalyst, a method for producing optically active allylic esters which comprises using, as the copper catalyst, a catalytic amount of an optically active copper complex prepared by the treatment of a copper compound with an optically active Schiff's base of the formula:



(I)

or an optically active amino acid of the formula:



(II)

wherein R_0 is an optically active moiety selected from the group consisting of C_4–C_{20} alkyl, C_4–C_{20} cycloalkyl and C_8–C_{20} aralkyl which may contain an unsaturated bond and/or a C_1–C_{20} alkoxy group, hydroxy, chlorine or bromine; X and Y are each hydrogen, halogen, C_1–C_4 alkyl, C_5–C_8 cycloalkyl, C_7–C_{15} aralkyl, C_6–C_{12} aryl or C_1–C_4 alkoxy, R_1 and R_2 are each C_1–C_{10} alkyl, C_7–C_{15} aralkyl or C_6–C_{15} aryl which may contain an unsaturated bond and/or halogen, a C_1–C_{10} alkoxy group, cyano or amino, R_3 is C_1–C_{10} alkyl, cyclohexyl, C_7–C_{10} aralkyl or C_6–C_{10} aryl which may contain an unsaturated bond and/or halogen, a C_1–C_{10} alkoxy group, hydroxyl or methylsulfonyl, or when R_3 is linked together with R_2, they form trimethylene or tetramethylene optionally substituted with halogen, hydroxyl or a C_1–C_{10} alkoxy group, and the asterisk (*) indicates an asymmetric carbon atom, the ester moiety in said allylic ester being derived from the organic peroxide and/or the solvent in which the reaction is conducted if a solvent is used, at least one of said organic peroxide and said solvent having an acyl moiety from which to form said ester moiety.

4,069,386

15-ALKYL PROSTAGLANDINS E_1

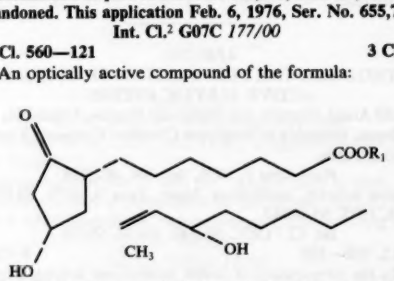
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 525,692, Nov. 21, 1974, abandoned, which is a continuation of Ser. No. 412,054, Nov. 2, 1973, abandoned, which is a division of Ser. No. 288,618, Sept. 13, 1972, Pat. No. 3,855,270, which is a continuation of Ser. No. 37,308, May 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 648,992, June 26, 1967, abandoned. This application Feb. 6, 1976, Ser. No. 655,796

Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—121 **3 Claims**

1. An optically active compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,069,387

16-CHLORO-SUBSTITUTED PROSTAGLANDINS AND DERIVATIVES THEREOF

Masaki Hayashi; Seiji Kori, and Katsuichi Shimoji, all of Takatsuki, Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

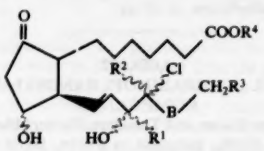
Filed July 29, 1976, Ser. No. 709,847

Claims priority, application United Kingdom, Aug. 8, 1975, 33235/75

Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—121 **10 Claims**

1. A compound of the formula:



wherein B represents a single bond or a straight- or branched-chain alkylene group containing from 1 to 9 carbon atoms, R^4 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R^1 represents a hydrogen atom or methyl or ethyl group, R^2 represents a hydrogen atom or a methyl or ethyl group and R^3 represents a chlorine atom or a hydroxy group and cyclodextrin clathrates of such acids and esters and, when R^4 represents a hydrogen atom, non-toxic salts thereof.

4,069,388

PREPARATION OF OXALATE ESTERS FROM CARBON MONOXIDE AND AN ALKOXYCYCLOALKENE

Lee R. Zehner, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

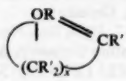
Filed Oct. 22, 1976, Ser. No. 734,799

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.[2] **C07C** *67/36, 69/36*

U.S. Cl. 560—204 **26 Claims**

1. A process for the preparation of oxalate esters which comprises reacting under substantially anhydrous conditions an alkoxycycloalkene having the formula



wherein R is an alkyl, or aralkyl group, R' is hydrogen or a straight or branched chain alkyl group which may be the same or different on the cyclic ring and x is an integer of from 3 to 6, with carbon monoxide, a monohydric saturated aliphatic, alicyclic or aralkyl alcohol, which may contain other substituents which do not interfere with the reaction, and oxygen, at a pressure of between about 500 psig and 3000 psig and at a temperature in the range of about 50° C. to 200° C in the presence of an effective amount of a catalyst selected from the group consisting of palladium, platinum, rhodium, cadmium, cobalt, zinc and copper salt compounds or mixtures thereof, and a catalytic amount of

a. an aliphatic, cycloaliphatic, aromatic or heterocyclic amine or ammonia,

b. a copper (II) or iron (III) oxidant salt compound, and

c. an ammonium or substituted ammonium salt compound, and recovering the desired oxalate ester.

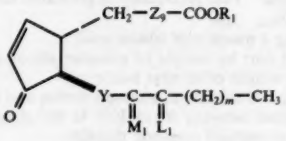
4,069,389

3,7-INTER-M-PHENYLENE-4,5,6-TRINOR-9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

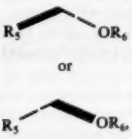
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sept. 17, 1975, Pat. No. 4,016,184.
This application Dec. 30, 1976, Ser. No. 756,110
Int. Cl.^{2} C07C *69/76*
U.S. Cl. 560—53 **33 Claims**

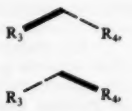
1. A prostaglandin analog of the formula



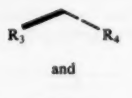
wherein Y is cis-CH=CH—or trans -CH=CH—;
wherein *m* is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is mehtyl only when the other is hydrogen;
wherein L_1 is

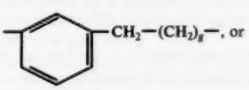


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one ot 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically accepted cation; and
wherein Z_9 is

(1)



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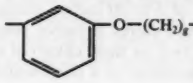
(2)



wherein *g* is one, 2, or 3.

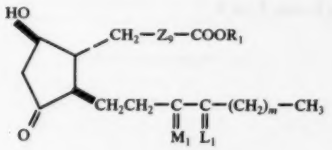
4,069,390

3,7-INTER-M-PHENYLENE-4,5,6-TRINOR-13,14-DIHYDRO-9β-PGD$_1$ COMPOUNDS

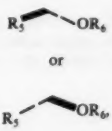
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sept. 17, 1975, Pat. No. 4,016,184.
This application Dec. 30, 1976, Ser. No. 756,102
Int. Cl.^{2} C07C *69/76*
U.S. Cl. 560—53 **25 Claims**

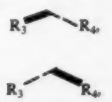
1. A prostaglandin analog of the formula



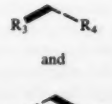
wherein m is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



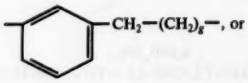
or a mixture of



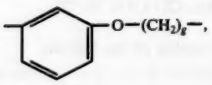
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_9 is



(1)



(2)

wherein g is one, 2, or 3.

4,069,391

PROCESS FOR THE PRODUCTION OF POLY(ALLYL SILICOFURMATE)

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 622,525, Oct. 15, 1975, Pat. No. 4,020,259, which is a continuation-in-part of Ser. No. 551,534, Feb. 21, 1975, Pat. No. 3,956,466, which is a continuation-in-part of Ser. No. 71,628, Sept. 11, 1970, abandoned. This application Jan. 6, 1977, Ser. No. 757,239

Int. Cl.² C08F *14/02, 14/16, 114/14, 30/08*

U.S. Cl. 526—17 **5 Claims**

1. The process for the production of poly(allyl silicoformate) by the following steps:

a. providing a quantity of silicon acid;

b. mixing 1 part by weight of granular silicon acid with 2 parts by weight of an allyl halide;

c. agitating said mixture in a closed system and keeping the temperature between 0° to 100° C for about 20 to 40 minutes at ambient pressure; thereby

d. producing poly(allyl halide) polymer;

e. adding 1 part by weight of sodium carbonate to the mixture of silicon acid and poly(allyl halide) polymer;

f. heating said mixture to 60° to 80° C while agitating for 20 to 40 minutes under ambient pressure, thereby

g. producing poly(allyl silicoformate) polymer and salt;

h. washing said mixture with water;

i. filtering off the salt and water, thereby

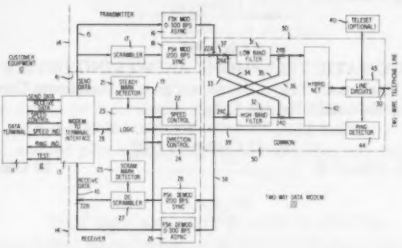
j. recovering poly(allyl silicoformate) polymer.

4,069,392

DUAL SPEED FULL DUPLEX DATA TRANSMISSION

Henry Robert Goldenberg, Hazlet; Richard John Peck, Eatontown; Shih Yung Tong, Holmdel, and David Allen Webb, Bricktown, all of N.J., assignors to Incorporated Bell Telephone Laboratories, Murray Hill, N.J.

Filed Nov. 1, 1976, Ser. No. 737,789
Int. Cl.[2] H04Q *5/00*; H04M *11/06*
U.S. Cl. 178—58 R 7 Claims



1. In a data transmission system including a two-way point-to-point transmission channel capable of conveying supervisory signals and message-data signals between data stations;

transmitting means at each station selectively operable at more than one data transmission speed and format comprising at least a low-speed asynchronous data modulator, a high-speed synchronous data modulator, and means for connecting said low-speed and high-speed modulators alternatively to said transmission channel;

receiving means at each station selectively operable at more than one data transmission speed and format comprising at least a low-speed asynchronous demodulator compatible with said low-speed modulator, a high-speed synchronous demodulator compatible with said high-speed modulator, and means for connecting said low-speed and high-speed demodulators alternatively between said transmission channel and said station; and

supervisory signaling means at each station for exchanging control signals before message data transmission over said transmission channel between the station first to mark itself as an originating station to cause another station to adapt itself as an answering station to the speed and format of the originating station comprising logic means for controlling the transmission of signals uniquely representing the desired transmission speed and format of an originating station and for recognizing such signals at an answering station.

4,069,393

WORD RECOGNITION APPARATUS AND METHOD

Thomas B. Martin, Burlington; Marvin B. Herscher, Camden, and Robert B. Cox, Cinnaminson, all of N.J., assignors to Threshold Technology, Inc., Delran, N.J.

Continuation of Ser. No. 291,051, Sept. 21, 1972, abandoned.
This application Dec. 11, 1974, Ser. No. 531,543
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SD 27 Claims

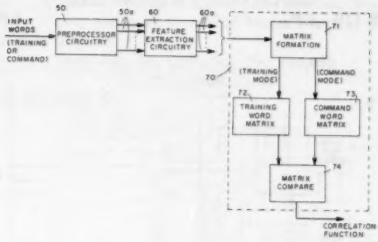
1. Apparatus which receives spoken input training words and a subsequent spoken input command word and generates a correlation function that is indicative of the resemblance of the command word to each training word, comprising:

a. feature extraction means for processing received input words and generating digital feature output signals on particular ones of a number of feature output lines, the particular ones being dependent upon the features present in an input word;

b. means for storing, as a time dependent matrix, the presence or absence status of the feature signals which occur during each training word;

c. means for storing, as a time dependent matrix, the presence or absence status of the feature signals which occur during the command word; and

d. means for comparing, member by member, the command word matrix with each training word matrix and for generating a correlation figure which reflects each matrix comparison, the member comparisons taking account only of the presence of features in the matrices being compared.

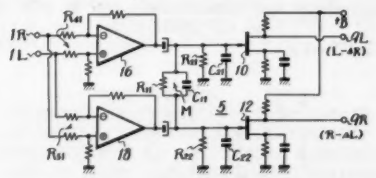


4,069,394

STEREOPHONIC SOUND REPRODUCTION SYSTEM

Toshitada Doi, Yokohama, and Hitoshi Wakabayashi, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 2, 1976, Ser. No. 692,108
Claims priority, application Japan, June 5, 1975, 50-67915
Int. Cl.[2] H04R *5/00*
U.S. Cl. 179—1 G 9 Claims

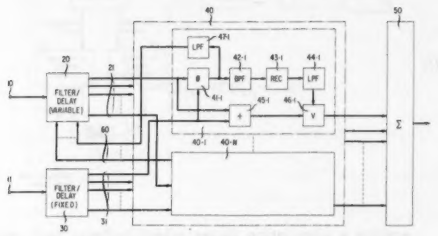


1. In a stereophonic sound reproduction system having a pair of spaced apart left and right loudspeakers and providing stereophonic left and right signals with a level difference therebetween for producing a sound image localized at a position spaced from the midpoint between said loudspeakers when said stereophonic left and right signals are respectively applied to said left and right loudspeakers; a converting circuit comprising left and right input terminals respectively receiving said stereophonic left and right signals, left and right output terminals connected with said left and right loudspeakers, respectively, means for transmitting said left and right signals from said left and right input terminals to said left and right output terminals, respectively, and frequency responsive means for reducing the level difference between said left and right signals, as transmitted to said left and right output terminals, in response to increases in the frequency of said signals so as to improve the localization of the resulting sound image.

4,069,395
ANALOG DEREVERBERATION SYSTEM

Donald Henry Nash, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 27, 1977, Ser. No. 791,416
Int. Cl.[2] G10L *1/00*; H04R *3/00*
U.S. Cl. 179—1 P 9 Claims



1. An analog dereverberation system comprising:

first filter/delay means for developing a first plurality of variably delayed analog bandpass signals in response to a first input signal and a control signal;

second filter/delay means for developing a second plurality of delayed analog bandpass signals in response to a second input signal;

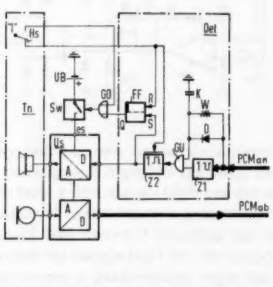
a plurality of correlator means responsive to corresponding signals of said first and second pluralities of bandpass signals for developing a plurality of nonreverberant bandpass signals and for developing said control signal; and

means for adding said plurality of nonreverberant bandpass signals to form a single analog nonreverberant signal.

4,069,396
POWER SAVING CIRCUIT FOR USE WITH A CONVERTER CIRCUIT IN A TELEPHONE SWITCHING INSTALLATION

Friedemann Vollnhals, Wolfratshausen, and Klaus Wintzer, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 13, 1976, Ser. No. 722,401
Claims priority, application Germany, Sept. 30, 1975, 2543696
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—2 A 7 Claims



1. In a telephone switching arrangement having a converter circuit connected to a telephone station of a telecommunications network for converting incoming PCM digital signals into analog signals and for converting outgoing analog signals into PCM digital signals, the improvement comprising:

a voltage source;

power switch means connected between said converter circuit and said voltage source for connecting said voltage source to said converter circuit;

pulse regenerator means triggered by at least one pulse of the incoming PCM digital signals for providing regenerated digital signals to said converter circuit;

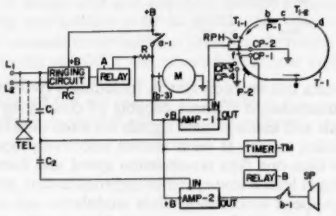
bistable multivibrator means connected to said pulse regenerator means for actuating said power switch means in the event said pulse regenerator means provides regenerated digital signals to said converter circuit; and

sensing means in said telephone station connected to said power switch means for actuating said power switch means in the event said telephone station is in the operating condition.

4,069,397
AUTOMATIC TELEPHONE ANSWERING DEVICE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,457
Int. Cl.[2] H04M *11/02*
U.S. Cl. 179—6 R 10 Claims



1. An automatic telephone answering device operating upon arrival of a calling signal, comprising an answering endless magnetic tape in which answering terms have been prerecorded with a pause interval to provide a blank portion therein so as to allow a calling party to talk for the pause interval, and loudspeaker means for reproducing the voice of the calling party, said device comprising:

a. actuating means fixedly located at the start point of said blank portion of said tape;

b. timer means between said tape and said loudspeaker means, said timer means being preset to make said loudspeaker means operable for a period of time shorter than the pause interval upon energization;

c. pickup means connected to said timer means and disposed to cooperate with said tape for energizing said timer means in cooperation with said actuating means, said pickup means being operated by said actuating means as said tape is moved on to energize said timer means,

whereby the voice of the calling party is audifly reproduced during a period of time less than said pause interval.

4,069,398
METHOD AND APPARATUS FOR PILOT SIGNAL CANCELLATION IN AN FM MULTIPLEX DEMODULATOR

Seijiro Fujie, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

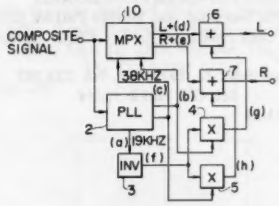
Filed Sept. 1, 1976, Ser. No. 719,629
Claims priority, application Japan, Sept. 2, 1975, 50-106393
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—15 BT 3 Claims

1. In an FM multiplex demodulator including means for providing left (L) and right (R) channel output signals from a composite input signal in response to opposite phase switching signals derived from a pilot signal, means for removing unwanted pilot signal components from the L and R output signals, comprising:

a. means for inverting the pilot signal,

b. means for individually multiplying the inverted pilot signal by each of the opposite phase switching signals to

produce signals equal in amplitude but opposite in phase to the unwanted pilot signal components, and



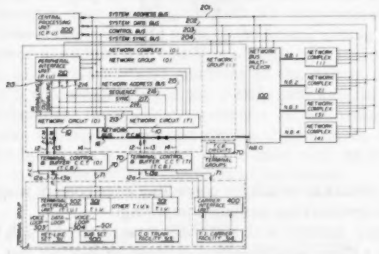
c. means for individually adding the multiplication signals to the respective L and R output signals, whereby the unwanted pilot signal components are effectively cancelled.

4,069,399

TDM PCM COMMUNICATION SYSTEM

Bruce Robert Barrett, Hazeldean, and Alan Stanley John Chapman, Kanata, both of Canada, assignors to Northern Electric Company, Limited, Montreal, Canada

Filed Nov. 17, 1975, Ser. No. 632,548
Int. Cl.² H04J *3/00*
U.S. Cl. 179—15 AL **8 Claims**



4. In a TDM PCM communication system having a switching network connected to a plurality of user terminals via an incoming path and an outgoing path, a method for exchanging PCM words between one and another of said user terminals, said PCM words each having *m* informtion bits distributed evenly across a frame of *n* channels, the method comprising the steps of:

a. generating sequences of an even number *n* of time slot addresses;

b. receiving a single information bit from the incoming path during the period of each time slot address occurrence;

c. transmitting the received information bits with a delay of *n*/2 time slot address periods;

d. causing the one user terminal, during each occurrence of one of the *n* time slot address to receive one of said transmitted information bits from the outgoing path and to transmit, on the incoming path, an information bit advanced by one in the order of bit significance in the PCM word format relative to the formation bit received from the outgoing path;

e. causing the other user terminal, during each time slot address occurrence delayed from said one time slot address by *n*/2 time slot address periods to receive one of said transmitted information bits from the outgoing path and to transmit, on the incoming path, an information bit advanced by one in the order of bit significance in the PCM word format relative to the information bit received from the outgoing path;

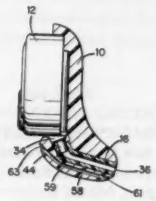
whereby *m* bit PCM words are exchanged bit by bit, between user terminals, in fixed pairs of time slots, which are separated by *n*/2 - 1 time slot periods.

4,069,400

MODULAR IN-THE-EAR HEARING AID

Donald L. Johanson, Wayland, and Thomas S. Chan, Somerville, both of Mass., assignors to United States Surgical Corporation, New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,438
Int. Cl.² H04R *25/02*
U.S. Cl. 179—107 E **6 Claims**



1. An in-the-ear hearing aid comprising:

a modular unit contained within a housing of standardized configuration and providing a wholly operable instrument, said housing including:

a mounting plate for attachment of said housing to an ear mold, and

a coupler for acoustic connection of the receiver of the hearing aid to the exit aperture of the ear mold, said coupler being removably attached to said housing and having an output tube outwardly extending in predetermined angular relation to said housing;

an ear mold adapted to fit the ear cavity of a user and having a recessed area onto which is secured the mounting plate of said housing for attachment of said housing to said ear mold, and a tip portion adapted to extend into the ear canal of a user and having an opening therethrough terminating in an exit aperture;

means for securing said housing to the recessed area of said ear mold; and

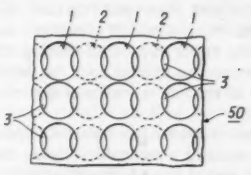
a flexible tubing extending through the opening in said tip portion of the ear mold and connected at one end to the output tube of said coupler and terminating at the other end at said exit aperture of the ear mold.

4,069,401

ACOUSTICAL FRICTIONAL RESISTANCE CONSTRUCTION AND APPARATUS FOR MANUFACTURING AN ACOUSTICAL RESISTANCE AND AN ASSOCIATED MAGNETIC SYSTEM

Fritz Vogelsinger, Vienna, Austria, assignor to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H., Austria

Filed Sept. 30, 1976, Ser. No. 728,288
Claims priority, application Austria, Oct. 2, 1975, 7537/75
Int. Cl.² H04R *1/20, 13/00*
U.S. Cl. 179—115 R **9 Claims**



1. An acoustical frictional resistance for electroacoustical transducers, comprising a thermoplastic sheet having one

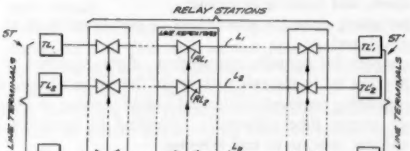
surface with a first plurality of impressions partially extending into said sheet, and having an opposite surface having a second plurality of impressions extending partially into said opposite surface and meeting said first plurality of impressions in said sheet, said first and second plurality of impressions overlapping partially and defining acoustical passages through said sheet at the overlapping areas.

4,069,402

REMOTE-TESTING ARRANGEMENT FOR PCM TRANSMISSION SYSTEM

Pietro Mantovani, San Secondo (Parma), and Silvio Roldi, Milan, both of Italy, assignors to Societe Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed July 28, 1976, Ser. No. 709,445
Claims priority, application Italy, July 28, 1975, 25817/75
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.31 R **10 Claims**



1. In a pulse-code-telecommunication system including a pair of head stations interconnected by a set of parallel two-way transmission channels, a set of line terminals at each head station respectively connected to said transmission channels, and a plurality of cascaded relay stations between said head stations, each relay station encompassing a set of line repeaters respectively inserted in said channels, the line terminals of one head station being adapted to transmit over the associated channel a test code for checking a selected line repeater inserted therein, each line repeater being provided with loop-closing means for retransmitting said test code to the originating line terminal,

the combination therewith of:

a service link extending from said one head station to all said relay stations;

a monitoring unit at each relay station connected to said service link;

signal-generating means at said one head station connected to said service link for transmitting thereover an address code identifying the monitoring unit of a relay station containing the selected line repeater;

discriminating means at each monitoring unit responsive to the corresponding address code for delivering a priming signal to all the line repeaters of the relay station so addressed;

receiving means at each line repeater responsive to said test code for emitting a recognition signal; and

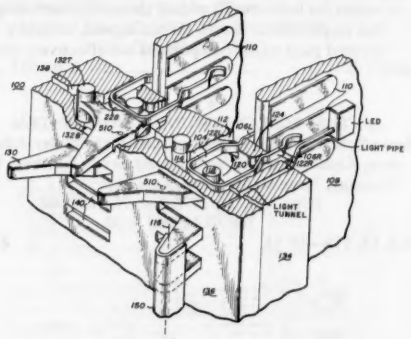
coincidence means at each line repeater connected to said receiving means and to said monitoring unit for operating said loop-closing means under the joint control of said priming and recognition signals.

4,069,403

SWITCHING APPARATUS FOR ELECTRICALLY CONTACTING CONDUCTIVE TERMINALS ON A CIRCUIT-CARRYING BOARD

Real J. Beaudette, San Jose, and Harold Patrick Krieg, Sunnyvale, both of Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Sept. 13, 1976, Ser. No. 723,252
Int. Cl.[2] H01R *33/54*
U.S. Cl. 200—51.12 **9 Claims**



1. An electrical switch for contacting edge contact strips on a conductor-carrying medium comprising:

a support member with a channel means therethrough having a floor which defines a plane of motion and two spaced walls;

a resilient, forked, conductive member movably retained within the channel and having at least two prong portions connected by a yoke portion, the prong portions supported by the floor and generally movable along the plane of motion while guided by the spaced walls, and adapted to receive and engage opposed surfaces of the conductor-carrying medium, at least one of the two prong portions adapted to contact a conducting terminal on the conductor-carrying medium proximate the edge thereof;

a toggle member mounted on the support member and pivotal about an axis of pivot;

engaging means carried on the toggle member at a position offset from the axis of pivot for rotatably engaging the forked conductive member;

a lever portion extending from the toggle member and adapted to be externally moved to pivot the toggle member causing the engaging means to move the forked conductive member along a travel path within the channel along the plane of motion in an outward direction away from the conductor-carrying medium or in an inward direction toward the conductor-carrying medium;

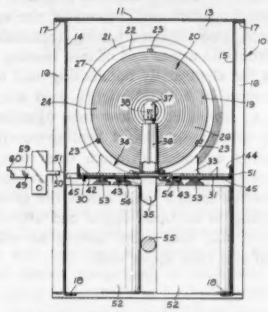
camming means on at least one of the prong portions; and

displacing means formed within the channel means by the contour of at least one of the spaced walls for engaging the camming means on the prong portions causing the prong portions of the forked member to move relative to one another to engage and disengage the opposed surfaces of conductor-carrying medium as the forked conductive member moves along the travel path.

4,069,404
SLIDABLE SWITCH USABLE WITH A PORTABLE WARNING LAMP

William Edward Minoprio, Blackburn, and Arthur Kenneth Horsfield, Preston, both of England, assignors to Dorman Smith Traffic Products Limited, Southport, England

Filed Aug. 13, 1976, Ser. No. 714,106
Int. Cl.[2] F21V *23/04*
U.S. Cl. 200—60 11 Claims

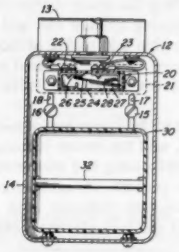


1. An electric lamp having a switch assembly comprising a support carrying a conducting protuberance, and a slidable conductive strip member mounted for longitudinal sliding movement relative to said support and having a bridge portion disposed to register with and form a bridge over said protuberance to provide an "off" condition of the switch, in which there is no contact between the slidable strip member and the protuberance, longitudinal movement of the slidable strip member serving to bring said slidable strip member, adjacent to the bridge portion thereof, into contact with the protuberance to provide an "on" condition of the switch.

4,069,405
SWIMMING POOL ALARM SYSTEM

Raoul Fima, Addison, Ill., assignor to Fima Laboratories, Inc., Oak Brook, Ill.

Filed Mar. 24, 1976, Ser. No. 669,898
Int. Cl.[2] H01H *36/02*
U.S. Cl. 200—84 C 1 Claim



1. For use in a swimming pool, a device for providing a signal in response to a change in the water level at a particular location in said pool, at which said device is mounted, said device comprising

a bracket mounted to a side of said pool,

a housing member slidable mounted to said bracket for adjustable movement in a vertical direction,

fastening means accessible only from within said housing for locking said housing in an adjusted position of said bracket,

a magnetically operated normally closed switch mounted in a fixed position near the top of said housing a substantial distance above said fastening means,

an axially polarized permanent bar magnet,

a float disposed in said housing between an upper position overlying said fastening means and a lower position below said fastening means,

means mounting said magnet at a fixed position in said float whereby said magnet maintains said switch open when said float is in said upper position and permits said switch to close when said float is in said lower position,

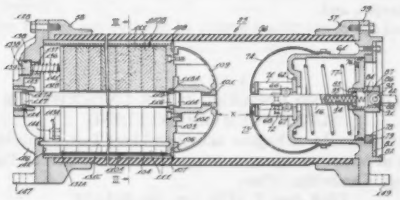
a cover member secured to said housing member to prevent access to said float and said fastening means,

whereby said housing may be positioned whereby said magnet maintains said switch open until the water level in said housing drops a predetermined amount and said switch closes.

4,069,406
CLOSING RESISTOR SWITCH FOR GAS INSULATED CIRCUIT BREAKER

Gerardus J. Meinders, Florence, Miss., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 2, 1975, Ser. No. 636,824
Int. Cl.[2] H01H *33/16*
U.S. Cl. 200—144 AP 9 Claims



1. In a gas insulated circuit breaker having an enclosure containing an insulating gas at a relatively low pressure;

an interrupter within said enclosure and having a pair of contacts movable relative to each other between open and closed positions;

a plurality of independent resistance means connected in parallel with each other, each of said plurality of resistance means including a plurality of individual resistance elements arranged in stacked array, each stack of individual resistance elements being biased into intimate engagement, said stacks of resistance elements being enclosed in a housing;

switch means operable when actuated to a closed position to connect said resistance means in parallel with said interrupter contacts; and,

operating means operably connected to close said interrupter contacts and to actuate said switch means to a closed position just prior to the closing of said interrupter contacts.

4,069,407
UNDERWATER CUTTING ROD

Jerome S. Brower, 2040 N. Towne Ave., Pomona, Calif. 91767

Filed Dec. 10, 1975, Ser. No. 639,289
Int. Cl.[2] B23K *7/00, 9/00*
U.S. Cl. 219—70 6 Claims

1. A cutting torch primarily for underwater use in which electrical current and reactive gas flow are used in combination to cause progressive burning of a metallic electrode, the torch comprising

a metallic electrode comprising

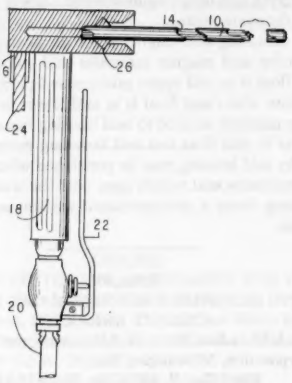
a metallic tube;

a plurality of ferrous metal rods within said tube;

at least one rod made of a metal selected from the group

consisting of aluminum, magnesium, titanium and alloys thereof disposed within said tube; and

a layer of insulating material substantially covering the exterior surface of said tube;



means for connecting a source of electrical current to said tube and for supplying current substantially continuously thereto; and

means for connecting a supply of reactive gas to said tube.

4,069,408

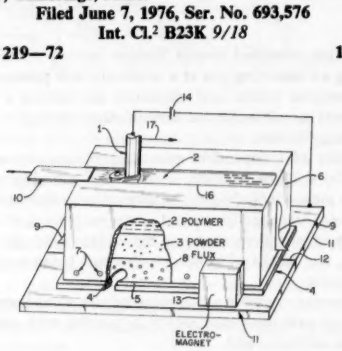
METHOD AND APPARATUS FOR UNDERWATER SUBMERGED ARC WELDING

Koichi Masubuchi, Arlington, and Chon-Liang Tsai, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 7, 1976, Ser. No. 693,576

Int. Cl.[2] B23K *9/18*

U.S. Cl. 219—72 **12 Claims**



1. Apparatus for underwater arc welding comprising:

an enclosure having a perforable bottom,

said enclosure containing layers of welding flux, an insulating powder and a water-insoluble, high-viscosity liquid in that order on said bottom,

a longitudinal slot in the top of said enclosure

whereby an electrode may enter said enclosure through said slot to penetrate said layers to perforate said bottom.

4,069,409

ELECTRICALLY HEATED FLUID COUPLING APPARATUS

Wayne B. Noland, 340 Crescent Drive, Carlisle, Iowa 50047, and Gail L. Noland, 4530 W. 38th St., St. Louis Park, Minn. 55416

Filed July 28, 1975, Ser. No. 599,385

Int. Cl.[2] H05B *3/02*; F16L *53/00*; F24H *1/12*; A01K *7/00*

U.S. Cl. 219—301 **3 Claims**

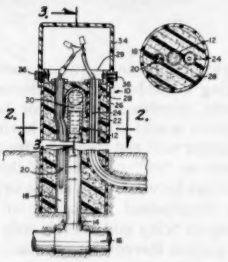
1. An electrically heated fluid coupling apparatus exposed to severe weather conditions for connecting below the ground a fluid source to an external device for using the fluid comprising:

a fluid conduit adapted at its lower end to be connected to a fluid source below the ground surface;

a hollow heating conduit extended longitudinally in side-by-side heat exchange contact with said fluid conduit, having a length approximate that of said fluid conduit, said heating conduit having an upper end extended above the upper end of said fluid conduit;

an electric resistance heating element disposed within said hollow heating conduit and extending the approximate length thereof, said element having terminals extended outwardly from the upper end of said heating conduit;

electric means for electrically connecting said heating element to a source of electric energy, said electric means comprising an elongated hollow tube extended through substantially the length of said heating conduit, and an electrical cable extended through said tube, said tube extended closely adjacent in side-by-side relationship with said fluid conduit from a point below the ground surface and terminating in an open upper end above said fluid conduit upper end, said cable having an end extended outwardly of said tube upper end;



an outside casing disposed about said fluid conduit, said heating conduit and said electric, means, said casing having at least one aperture formed therein and having a length at least as coextensive with that of said heating conduit, said one or more apertures being above the ground surface, said casing upper end being open through which sole access can be obtained to the open upper ends of said heating conduit and hollow tube;

thermal insulation disposed within said outside casing and substantially filling the space therewithin about said fluid conduit, said heating conduit and said electric means;

coupling means within said casing affixed to said fluid conduit and registered with each of said at least one aperture for providing access to the fluid delivery external devices; and

top means affixed to the upper end of said casing for closing said upper end, said top means removably secured to the upper end of said casing and cooperating with the upper end thereof to provide an enclosure within which the electrical connection between said electric resistance heating element and said electrical cable can be made.

4,069,410

HEAT TREATING APPLIANCE AND CABLE

Henry Keep, Jr., 88 E. Wharf Road, Madison, Conn. 06443

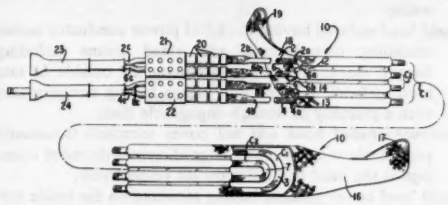
Filed Feb. 12, 1976, Ser. No. 657,452

Int. Cl.[2] H05B *3/58*

U.S. Cl. 219—535 **8 Claims**

1. In an appliance adapted to be coiled about a steel pipe or like structure for heat treating it before or to relieve stresses in it after welding, comprising an elongate reticulate sleeve of interlaced heat and oxidation resistant wire and at least one length of pliable electrical heating cable fixed inside and along said sleeve, said cable comprising a central conductor com-

posed of an electrical resistance alloy and a plurality of contiguous layers of high temperature resistant insulating material covering said conductor and encased in a sheath of interlaced heat and oxidation resistant wire, the improvement which comprises each cable length of said at least one cable length being doubled back along itself to form two heating legs held spaced apart and extending inside said sleeve from a cable loop



interconnecting them near yet inside one end of the sleeve to and through respective openings in the sleeve near its other end, said legs having terminal portions extending outside said sleeve from said openings for connection with a source of current, said sleeve comprising at each said end a portion thereof extending beyond said at least one cable length therein for securing the appliance in place on the structure to be heat treated.

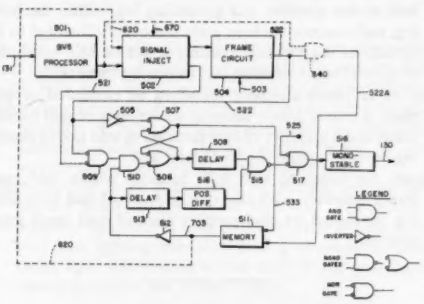
4,069,411
IMAGE ANALYSIS SYSTEM AND METHOD FOR MINIMIZING PARALYSIS ANGLE

Roger R. Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 636,273, Nov. 28, 1975, which is a continuation of Ser. No. 434,529, Jan. 18, 1974, abandoned, which is a division of Ser. No. 210,278, Dec. 20, 1971, Pat. No. 3,805,028, which is a continuation of Ser. No. 835,673, June 23, 1969, abandoned. This application June 24, 1976, Ser. No. 699,551

Int. Cl.[2] G06M *11/02*

U.S. Cl. 235—92 PC **11 Claims**



1. In an image analysis system for scanning a feature with an energy beam and providing a current binary video signal having leading and trailing edges corresponding to the leading and trailing edge intercepts of said beam with said feature, and for comparing a given line scan binary video signal, stored for one line scan after the given line scan, with the current binary video signal of the line scan following the given line scan to produce a modified binary video signal having a leading edge corresponding to that of said current binary video signal and a trailing edge corresponding to the last-to-occur of the trailing edges of said current and of said stored video signal, a device for reducing the paralysis angle of the scanned feature to essentially zero, comprising:

means for generating for successive current line scans and successively temporarily storing data corresponding to the X-coordinates of the intercepts of said beam with said feature for each successive current line scan;

means for successively reading those X-coordinates which are currently so temporarily stored and successively selecting, as a function of data derived from successive given and current scan lines, of those X-coordinates so read, for successively storing, data defining the leading edge and trailing edge of said feature; and

means for generating successive said video signals stored for one line scan having values representing the leading and trailing edges corresponding in time to those of the successively selected X-coordinates.

4,069,412
AREA NAVIGATION SYSTEM

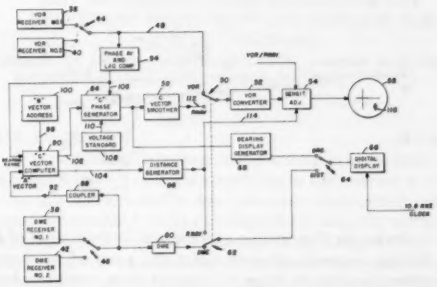
George B. Foster, Worthington, and Paul Douglas Gibbs, Blacklick, both of Ohio, assignors to Air Data, Inc., Worthington, Ohio

Filed June 5, 1974, Ser. No. 476,513

The portion of the term of this patent subsequent to Dec. 17, 1994, has been disclaimed.

Int. Cl.[2] G06G *7/78*

U.S. Cl. 364—448 **18 Claims**



1. An area navigation system comprising: first means for receiving station-to-aircraft vector angle signals; processing means including averaging means coupled to said first receiving means for averaging said vector signals, and lag compensation means coupled to said averaging means, said lag compensation means, including means responsive to the amount of phase lag introduced by said averaging means for adjusting the degree of lag compensation; second means for receiving station-to-aircraft magnitude signals; a waypoint-to-aircraft vector computer having said signals from said processing means and said second receiving means coupled thereto; a station-to-waypoint vector generator, also coupled to said computer, to produce an electrical output signal representative of the corresponding waypoint-to-aircraft vector; and means coupled to said computer output signal for developing a display of the value of said aircraft-to-waypoint vector.

4,069,413
PROCESS MEASUREMENT AND CONTROL

Robert W. Rutledge, and Franklin D. Ganaway, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 29, 1976, Ser. No. 736,905

Int. Cl.[2] G05B *11/42;* **G06G** *7/57, 7/58*

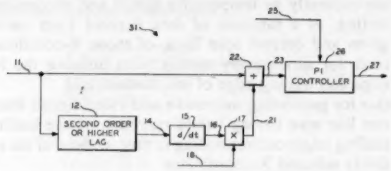
U.S. Cl. 364—118 **27 Claims**

1. Apparatus comprising:

second or higher order lag means for accepting a process measurement signal and delivering in response thereto a lagged process measurement signal;

differentiator means for accepting said lagged process measurement signal and delivering in response thereto a derivative signal representative of the time derivative of said lagged process measurement signal; and

signal combining means for accepting said process measurement signal and said derivative signal and delivering in



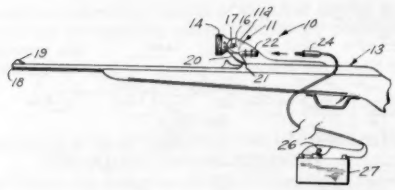
response thereto a process variable signal representative of the weighted sum of said process measurement signal and said derivative signal.

4,069,414

FIREARM SIGHT LIGHT

Arthur O. Bell, 510 E. Wyatt, Herington, Kans. 67449

Filed June 4, 1976, Ser. No. 692,896
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—110 **2 Claims**



1. A device for illuminating a target and the front sight of a rifle having conventional open sights and a tapped receiver, comprising: an electric lamp; a U-shaped sheet metal bracket having a pair of lateral protruding ears bent upward to a vertical position with an elongated portion extending out from the base thereof and perpendicular to said ears, said elongated portion forming a located above and parallel to the bore of the rifle supporting said lamp when properly mounted on the receiver with external power supplied through a phone jack attached to said bracket, said bracket having drilled holes properly spaced to coincide with holes in the receiver normally used for mounting a bracket to accommodate a telescopic sight, four drilled holes for wire fasteners to hold said female phone jack securely, and two elongated holes in said vertical ears of said bracket for bolts that support said light and allow adjustment of said light on a horizontal plane, said electric lamp mounted in said bracket by means of bolts with neoprene washers to prevent oscillation but allow adjustment in a vertical plane, said lamp comprised of a case to hold a lens, reflector, a bulb connected electrically through said phone jack, electrical cord, a toggle switch that is mounted physically and electrically to a six volt dry cell battery mounted on the user's belt, said lamp being mounted a sufficient distance above the front and rear sights to allow sighting on the target in a normal manner.

4,069,415

HIGH INTENSITY DISCHARGE LAMP FOR USE IN EXPLOSIVE ATMOSPHERES SUCH AS MINES

Perfecto Dacal, Beckley, W. Va., assignor to Control Products Inc., Beckley, W. Va.

Filed Jan. 7, 1977, Ser. No. 757,637
Int. Cl.[2] F21L *15/06*
U.S. Cl. 362—263 **8 Claims**

1. A high intensity discharge lamp permissible for use in explosive atmospheres such as mines comprising:

a rectangular bulb housing and a cage-like outer guard assembly therefor;

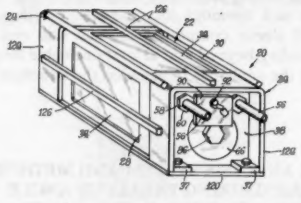
said bulb housing having four sidewalls extending between head and tail endwalls;

one of said sidewalls being substantially imperforate to serve as a mounting base, and window means of transparent material in at least some of the other three of said sidewalls;

said head endwall having electrical power conductor means extending therethrough, and gland means including flanged threaded bushing means on the outside of said head endwall, said bushing means having flange means with a plurality of wrench-engageable flats;

screw-threaded head and tail cover members threadedly engageable with opposite, aligned, screw-threaded openings in the head and tail endwalls respectively;

said head cover member having mounted on the inside surface thereof a bulb socket member in substantially coaxial relation therewith, and a grounding lug in eccentric relation therewith, said head cover member having a central



boss on the outside thereof with a plurality of wrench-engageable flats;

said head cover member having a first locking plate removably fastened to the outside surface thereof and simultaneously engageable with flats on said boss and on said bushing means to prevent rotation and loosening thereof;

a screw-threaded inspection plug threadedly engageable with a threaded access opening in one of said sidewalls, said access opening positioned to provide access to said bulb socket member and grounding lug within the housing, and a second locking plate removably fastened to the outside of the housing abutting a flat on said inspection plug to prevent rotation and loosening thereof;

said outer guard assembly including an elongated support plate, a pair of hoops fastened to the ends of said support plate, and a plurality of bars fastened to said hoops extending parallel to said support plate; and

means for fastening said bulb housing within said outer guard assembly with said one sidewall of said bulb housing supported on said support plate of said outer guard assembly.

4,069,416

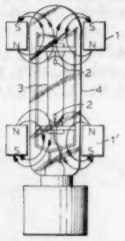
LAMP EQUIPPED WITH MAGNETS

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,699
The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.
Int. Cl.[2] F21V *13/00*
U.S. Cl. 313—161 **7 Claims**

1. An electrically energized illuminating lamp comprising a bulb and a source of light within said bulb and emitting light through a portion of said bulb, and at least one magnet around the exterior wall of the bulb at a position other than the portion of the bulb through which light is emitted for attracting metal vapor and volatile matter generated inside the bulb during operation of the lamp and depositing them onto the interior

wall of the bulb at a position corresponding to that of the magnet, whereby deposits are prevented on the interior wall of



the bulb in light transmission areas thereof to reduce emission of light from the lamp.

4,069,417

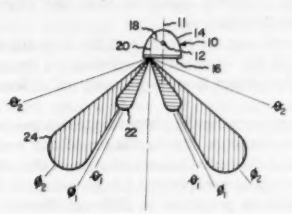
LIGHTING PANEL HAVING IMPROVED REFRACTING ELEMENTS

James D. Howe, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 571,171, May 1, 1975. This application Mar. 29, 1976, Ser. No. 671,888

Int. Cl.² F21V *5/00*

U.S. Cl. 362—330 **4 Claims**



1. A lighting panel useable in controlling locally unidirectional light passing therethrough to uniformly radially distribute the light into each of at least two peak lighting intensities within the control range to improve illumination, comprising:

a plurality of light modifying elements for substantially uniformly controlling the radial distribution of locally unidirectional light within a control range,

each element being constructed to critically reflect the incoming locally unidirectional light and then refract the reflected light into at least two uniformly radially distributed peak lighting intensities having substantially uniform radial light distribution within each of the peak lighting intensities within the control range.

4,069,418

DETACHABLE HIGH-SPEED OPTOELECTRONIC SAMPLING HEAD

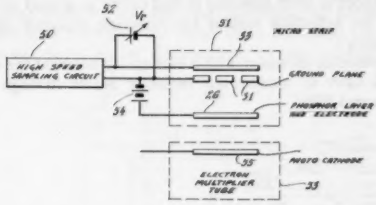
Henry Merkelo, Urbana, Ill., assignor to The University of Illinois Foundation, Urbana, Ill.

Filed Mar. 2, 1976, Ser. No. 663,283

Int. Cl.² H01J *39/00, 39/12*

U.S. Cl. 250—207 **11 Claims**

1. A high-speed optoelectronic sampling head comprising a detachable housing for use with a photo amplifying device, said housing defining an evacuated chamber, a photoemissive strip fixedly mounted in said chamber, a ground plane fixedly mounted in said chamber spaced from said photoemissive strip and defining a microstrip ground plane for said photoemissive strip, feedthrough means extending through a wall of said housing for propagating a high-speed sampling potential difference between said photoemissive strip and said ground plane, a phosphor layer in said chamber positioned to receive photoelectrons emitted from said photoemissive strip, said housing having a first window positioned to direct light to be detected



to said photoemissive strip, and a second window transparent to phosphorescent light from said phosphor layer for directing said phosphorescent light from said chamber externally of said housing.

4,069,419

DRY DEVELOPER COMPOSITION FOR DYE PENETRANT INSPECTION AND METHOD FOR EMPLOYING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 8, 1975, Ser. No. 611,292

Int. Cl.² G03K *3/00*

U.S. Cl. 250—302 **18 Claims**

1. A method for detecting cracks and flaws in the surface of an object, which comprises applying to said surface a water washable biodegradable dye penetrant composition which consists essentially of (1) a biodegradable nonionic surfactant selected from the group consisting of (a) straight chain, primary, aliphatic oxyalkylated alcohols, wherein said alcohols can contain from 8 to 20 carbon atoms and the oxyalkyl groups are a mixture of ethylene oxide and propylene oxide groups, and (b) ethoxylates of linear secondary aliphatic alcohols, with the hyroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide and (2) a small amount of a dye soluble in said surfactant, removing said dye penetrant composition from said surface without removing liquid dye penetrant from said cracks and flaws in said surface, applying to said surface a dry developer composition consisting essentially of about 25 to about 65% talc and about 35 to about 75% of fumed silica, by weight, said fumed silica having a particle size less than the particle size of said talc, said dye penetrant composition in said cracks and flaws being converted to a gel when contacted with said developer composition, removing excess developer and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and flaws.

4,069,420

OPTICAL GAS ANALYZER

Thaddeus C. Ross, Santa Barbara, Calif., assignor to Cavitron Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,464

Int. Cl.² G01N *21/26*

U.S. Cl. 250—341 **44 Claims**

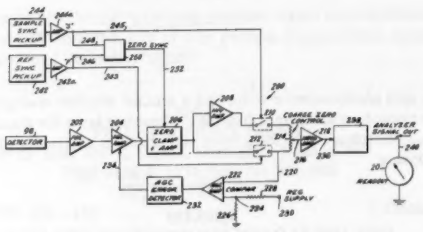
1. In an optical gas analyzer including in combination, a sample chamber, a reference chamber, to provide dual optical paths one for analysis of a sample gas, the other for reference, radiation projector means mounted at one end of said chambers, means for chopping and directing the radiation beams alternately along the two paths, the improvement which comprises radiation detector means positioned at the other end of said chambers comprising:

A. housing means open at the front end thereof and defining a cavity,

B. a reflective surface within said cavity facing the front end of said housing means to reflect energy beams transmitted along said paths,

C. a spectral filter mounted in said cavity in spaced relation to the reflective surface for receiving reflected energy beams,

D. a detector mounted within said cavity adjacent the spectral filter to receive the radiation beams through said spectral filter,



E. sealing means cooperating with said housing means to provide an air tight seal to said cavity and permitting energy beams to enter through the front end of said housing means to engage the reflective surface and be reflected therefrom towards the spectral filter, and

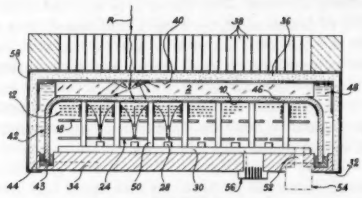
F. masking means contained within said cavity in the form of a spectrally absorbing gas so as to eliminate the effect of an interfering gas that is contained in spectral proximity to the gas of interest in the sample gas such that the gas having spectral absorbing lines which overlap in the region covered by the spectral filter and specifically tuned to the absorption spectrum of the gas of interest is substantially eliminated.

4,069,421

DEVICE FOR LOCALIZING LIGHT PHENOMENA

Jacques Bourdel, St-Martin d'Uriage, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 12, 1976, Ser. No. 666,450
Claims priority, application France, Mar. 18, 1975, 75 08451
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S **15 Claims**



15. A device for localizing radiations comprising:

a photocathode means for converting said radiations to emitted photoelectrons;

nonelectron multiplying means for focusing said emitted photoelectrons in the form of a number of separate beams, each of said beams corresponding to photoelectrons emitted by a well-localized fraction of said photocathode;

means for accelerating photoelectrons of said beams; and

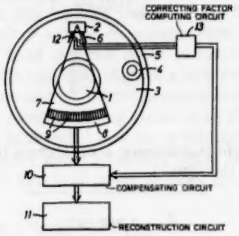
means for detecting and localizing said beams of photoelectrons including a a scintillator placed behind said accelerating means, said scintillator acting as a light guide, said means for detecting and localizing further including four photomultipliers disposed at uniform intervals on the periphery of said scintillator.

4,069,422

APPARATUS FOR EXAMINING OBJECTS BY MEANS OF PENETRATING RADIATION

Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Division of Ser. No. 474,767, May 30, 1974, Pat. No. 3,940,625.
This application Feb. 18, 1976, Ser. No. 659,155
Int. Cl.[2] G01N *23/06*
U.S. Cl. 250—445 T **5 Claims**



1. A medical radiographic apparatus including,

a. a source, arranged to irradiate a slice of an object with radiation projected in different directions in a substantially planar fan-shaped distribution about a mean direction,

b. detector means, sensitive to the radiation and disposed to receive and to provide output signals indicative of the intensity of radiation emergent from the object in the plane of the distribution,

c. means for moving the source and the detector means, in the plane of the distribution, relative to the object, to irradiate the object from a plurality of different mean directions,

d. means for processing the output signals provided by the detector to derive a representation of the variation of absorption of the radiation in said slice of the object and,

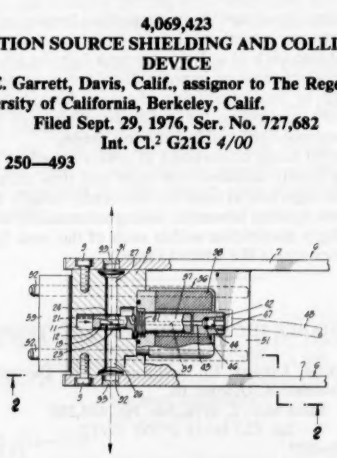
e. means adapted to compensate for variations in the hardness of radiation projected in different directions in the plane of the distribution.

4,069,423

RADIATION SOURCE SHIELDING AND COLLIMATING DEVICE

Roger E. Garrett, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Sept. 29, 1976, Ser. No. 727,682
Int. Cl.[2] G21G *4/00*
U.S. Cl. 250—493 **7 Claims**



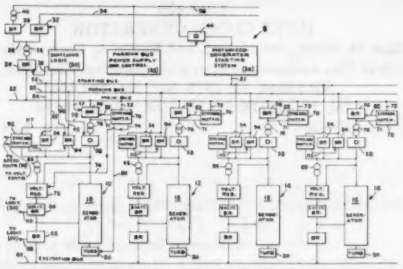
1. A radiation source shielding and collimating device comprising a body having a chamber therein, means defining a radiation passage from said chamber to the exterior of said body, a source of radiation at atmospheric pressure and in said chamber, means for subjecting said chamber to a subatmospheric pressure, and an indicator responsive to the pressure in said chamber.

4,069,424

SHAFT TURNING PARKING BUS FOR MULTIPLE UNIT INSTALLATIONS UTILIZING A SINGLE MOTORIZED GENERATOR CONTROL SYSTEM

Jerry D. Burkett, Hopewell Junction, N.Y., assignor to Turbodyne Corporation (Gas Turbine Div.), Saint Cloud, Minn.

Filed May 10, 1976, Ser. No. 684,570
Int. Cl.[2] H02J 3/00
U.S. Cl. 307—87 11 Claims



3. In an electrical power generating installation of the type including a plurality of turbine-generator sets; a controlled variable frequency starting system; means for connecting the output from said starting system to the generator member of a selected turbine-generator pair for gradually increasing the frequency output of said starting system whereby to drive said generator as a synchronous motor to bring said turbine to a self-sustaining rotational velocity; means for disconnecting said generator from said system upon said turbine becoming self-sustaining; a power feeder network; and synchronization matching means for connecting said generator to said power feeder network upon a phase and frequency match being attained between said generator and power feeder network; the improvement enabling a single said starting system to be utilized in effecting transfer to a selected turbine-generator set to a low-speed turning configuration comprising:

parking bus means;

means for providing a potential to said parking bus means at a relatively constant, low frequency;

switching means for disconnecting a selected turbine-generator set from said power feeder network and for re-connecting said turbine-generator set to said starting system;

means for gradually reducing the frequency of said starting system output to gradually slow rotation of said turbine-generator set;

means for matching the phase and frequency of rotation of said selected turbine-generator set to the corresponding phase and frequency of said parking bus; and

means for switching and connecting the generator member of said selected turbine-generator set to said parking bus, to continue low speed turning of said selected turbine-generator set and for switching and reconnecting the generator member of said selected turbine-generator set to said starting system to bring said turbine-generator set into operating condition for reuse.

4,069,425

FULL-TIME FLOOD PROTECTION CONTROL FOR DISHWASHER

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

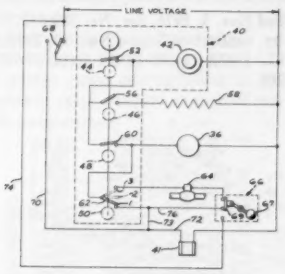
Filed June 3, 1976, Ser. No. 692,442
Int. Cl.[2] H01H 35/18
U.S. Cl. 134—57 D 6 Claims

1. An automatic dishwasher having a washing enclosure, a pump and motor assembly to circulate water within said enclosure, a dishwasher fill means including a high-impedance solenoid-controlled water inlet valve for supplying liquid to the enclosure, a low-impedance electrical control component to control the flow of liquid from the enclosure, and a control system comprising:

a single-pole, double-throw door interlock switch;

a timer including a motor and three cam-actuated switches, one of said switches controlling the power to the timer motor, another controlling the power to the motor and pump assembly, and the third controlling the power to the solenoid control of the water valve and drain valve;

a water level sensor, independent of the dishwasher fill



means, including a switch, said water level sensor switch being of the single-pole, double-throw type and connecting the high-impedance solenoid and said low-impedance electrical control component in series during normal operation and connecting said motor and pump assembly to a power supply during flooding conditions;

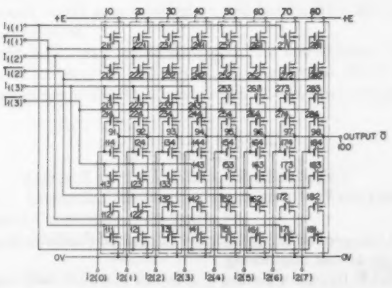
further, said single-pole, double-throw door interlock switch functioning to supply power from said water level sensor switch to said motor and pump assembly when the door is in its unlatched position.

4,069,426

COMPLEMENTARY MOS LOGIC CIRCUIT

Masataka Hirasawa, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1976, Ser. No. 729,771
Claims priority, application Japan, Oct. 6, 1975, 50-120486
Int. Cl.[2] H03K 19/08, 19/20, 17/04, 17/60
U.S. Cl. 307—205 8 Claims



1. A complementary MOS logic circuit for obtaining second logic signals corresponding to the state of logic combinations specified by N first logic signals wherein N is greater than 2 which logic circuit comprises a plurality of block series circuits each consisting of a first component series circuit formed of series connected first channel type IG-FET's and a second component series circuit formed of series connected second channel type IG-FET's arranged complementary to said first channel type IG-FET's and having a common output terminal connected to all the component series circuits; said N first logic signals or those complementary thereto being selectively sup-

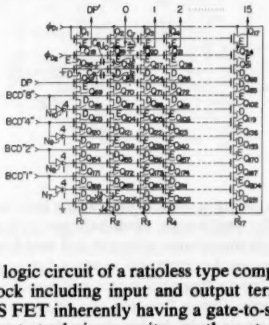
plied to the gates of the first and second channel type IGFET's to selectively conduct the second logic signals to the output terminal of the complementary MOS logic circuit through a predetermined component series circuit in response to said N first logic signals or those complementary thereto.

4,069,427

MIS LOGIC CIRCUIT OF RATIOLESS TYPE

Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 5, 1976, Ser. No. 739,042
Claims priority, application Japan, Nov. 10, 1975, 50-134108
Int. Cl.² H03K *19/08, 19/20;* **G11C** *19/00*
U.S. Cl. 307—205 **9 Claims**



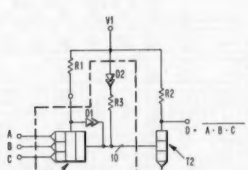
1. An MIS logic circuit of a ratioless type comprising at least one logic block including input and output terminals and at least one MIS FET inherently having a gate-to-source capacitance and a gate-to-drain capacitance, the gate of said FET being connected with said input terminal, and first and second means connected with the drain and source of said FET respectively for suppressing electric energy which tends to be fed back to from said output terminal to said input terminal through said capacitances.

4,069,428

TRANSISTOR-TRANSISTOR-LOGIC CIRCUIT

Dennis Conway Reedy, Stormville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,887
Int. Cl.² H03K *19/08, 19/12, 19/36*
U.S. Cl. 307—215 **13 Claims**



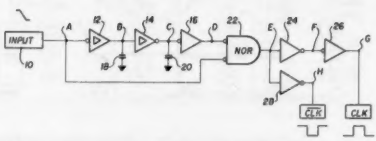
1. An improved monolithically integrated transistor-transistor-logic circuit comprising:
an input transistor having a collector region, a base region, and at least one emitter region connected to an input;
an output transistor having a colletor region, a base region, and at least one emitter region;
an electrical path coupling the base region of said output transistor to the collector region of said input transistor;
a first source of potential electrically coupled by means of a first impedance to the base region of said input transistor and by menas of a second impedance to the collector region of said output transistor;
a second source of potential electrically coupled to the emitter region of said output transistor; and
circuit means electrically coupled to said base region of said output transistor for biasing said output transistor into a first binary state when said inputtansistor malfunctions by failing to provide a current path for biasing said output transistor into a second binary state;
said circuit means electrically coupled to said base region of said output transistor being a high impedance current path comprising a series connected Schottky Barrier Diode and a third impedance.

4,069,429

IGFET CLOCK GENERATOR

William H. White, Indialantic, and Mario A. Lorie, Palm Bay, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Sept. 13, 1976, Ser. No. 722,444
Int. Cl.² H03K *5/159, 5/04, 19/08, 19/34*
U.S. Cl. 307—265 **17 Claims**



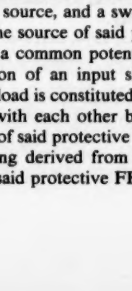
1. A pulse producing circuit comprising:
input means;
output means having a first input connected to said input means and a second input;
three inverter means connected in cascade between said input means and said second input of said output means, two of said inverter means being unbalanced in their response to voltage level changes at said input means each for producing a time delay;
said output means produces a pulse for a specific direction of voltage level change at said input means for a duration determined by said time delays.

4,069,430

MIS SWITCHING CIRCUIT CAPABLE OF ENDURING HIGH VOLTAGE

Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

Filed June 29, 1976, Ser. No. 700,745
Claims priority, application Japan, July 2, 1975, 50-80891
Int. Cl.² H03K *17/60, 19/40;* **H02H** *9/00*
U.S. Cl. 307—270 **6 Claims**

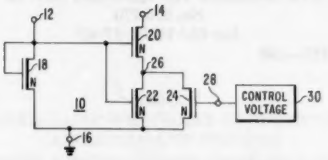


1. An MIS switching circuit capable of enduring a high voltage, comprising a load, at least one protective FET having its drain connected to said load and its gate arranged for connection to a DC bias source, and a switching FET having its drain connected to the source of said protective FET and its source connected to a common potential source and its gate arranged for reception of an input signal to the switching circuit, wherein said load is constituted by a plurality of FETs connected in series with each other between a high voltage source and the drain of said protective FET, the output of the switching circuit being derived from the junction point between said load and said protective FET.

4,069,431
AMPLIFIER CIRCUIT

Nicholas Kucharewski, Lebanon, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,500
Int. Cl.[2] H03K 5/20; H03F 3/185, 3/45; H03G 3/30
U.S. Cl. 307—355 11 Claims



1. A current amplifier with controlled current gain comprising:

input, output and common terminals;

a plurality of transistors of a first conductivity type, each having first and second electrodes with a controlled conduction path therebetween and having a control electrode, the conduction of the controlled conduction path of each transistor being controlled responsive to the potential between its second and control electrodes;

the first and second electrodes of the first of the plurality of transistors connected respectively to the input terminal and the common terminal;

the first electrode of the second of the plurality of transistors connected to the output terminal;

the first and second electrodes of the third of the plurality of transistors connected respectively to the second electrode of the second transistor and the common terminal;

direct-coupled feedback means between the first electrode of the first transistor and its control electrode to adjust the potential at the control electrode of the first transistor and condition the first transistor to conduct current, as applied to said input terminal, through its controlled conduction path;

means for applying a potential substantially equal to the potential at the control electrode of the first transistor to the control electrodes of the second and third transistors;

a source of gain-controlling signal;

a controlled impedance means connected between the common and output terminals; and

means for applying the gain-controlling signal to the controlled impedance means to vary, in accordance with the applied signal, the current gain of the amplifier within a range between a predetermined minimum current gain as defined by a ratio of the conductances of the first, second and third of the plurality of transistors and a predetermined maximum current gain as defined by the ratio of the conductances of first and second of the plurality of transistors.

4,069,432
SIGNAL COMPARATOR CIRCUIT

Lucas John Bazin, Stratford, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 563,684, March 31, 1975. This application June 7, 1976, Ser. No. 693,823
Int. Cl.[2] H03K 5/20
U.S. Cl. 307—357 4 Claims

1. A logic circuit for determining when all of a plurality of signals are within a predetermined amplitude range comprising:

first comparing means for developing a first output signal when all of said signals are above an upper predetermined amplitude, saaid first comparing means including:

first, second and third comparators;

threshold voltage means corresponding to one limit of said amplitude range coupled to each of said first, second and third comparators;

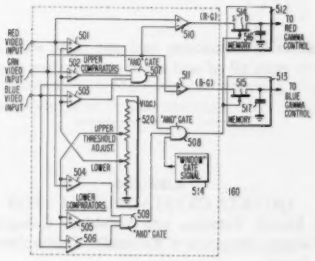
means coupling a different one of said signals to each of said first, second and third comparators, each of said comparators being operative to produce a first logic state when the signal applied thereto exceeds said one limit and a second logic state when the signal applied thereto is less than said one limit;

second comparing means for developing a second output signal when all of said signals are below a lower predetermined amplitude;

said second comparing means including:

fourth, fifth and sixth comparators;

threshold voltage means corresponding to another limit of said amplitude range coupled to each of said fourth, fifth and sixth comparators;



means coupling a different one of said signals to each of said fourth, fifth and sixth comparators, each of said comparators being operative to produce said second logic state when the signal applied thereto exceeds said other limit and said first logic state when the signal applied thereto is less than said one limit;

third comparing means coupled to said first and second comparing means for developing a third output signal in response to coincidence of said first and second output signals;

said third comparing means including:

a first AND gate coupled to said first, second and third comparators;

a second AND gate coupled to said fourth, fifth and sixth comparators;

a thrid AND gate coupled to said first and second AND gates to produce said first logic state when all of said signals are within said predetermined amplitude range.

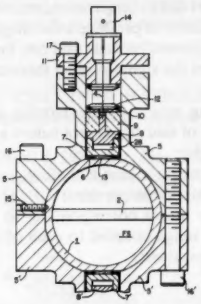
4,069,433
MODULAR TRANSDUCER ASSEMBLY

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 3, 1976, Ser. No. 692,694
Int. Cl.[2] H01L 41/04
U.S. Cl. 310—325 9 Claims

1. A unitary transducer assembly operative with a housing having first and second openings about a common axis, and operative with a fluid flow section of a pipe having a wall facing one of said openings, comprising the following stacked and dry-coupled elements disposed along said axis, radially toward said wall a piezoelectric cell sandwiched between a first and a second electrode; said second electrode being adapted for mating with said wall to serve as a front acoustic window in relation to said piezoelectric cell; said first electrode serving as a backing member for said piezoelectric cell; an insulating member and an end plate; said insulating member being disposed between said first electrode and said end plate;

an electrical connection being provided for said first electrode through said insulating member and said end plate; and means



for mechanically connecting said end plate with said second electrode to hold all of said elements together as a unit.

4,069,434

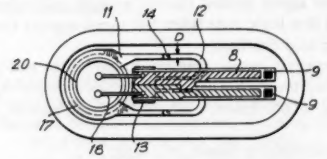
QUARTZ CRYSTAL OSCILLATOR

Masanori Kawai, Tatsuno, and Shinkichi Kobayashi, Chino, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 537,030, Dec. 27, 1974, abandoned. This application Dec. 10, 1976, Ser. No. 749,552

Int. Cl.[2] H01L *41/04*

U.S. Cl. 310—348 **11 Claims**



1. A hermetically sealed quartz crystal tuning fork vibrator assembly particularly for use as a time standard in an oscillator circuit comprising in combination a flexural mode tuning fork quartz crystal vibrator having two substantially opposed planar surfaces and being adapted to vibrate in a first vibratory direction substantially parallel to said surfaces, and a mounting plate having a first portion including a flat surface, said flat surface being secured to one of said opposed surfaces at a non-vibtatory portion of said tuning fork vibrator, said mounting plate including a second portion mounted to a reference member, said mounting plate having a resilient portion intermediate said first and second portions, said resilient portion being adapted to vibrate in said first vibratory direction at an angle of about 90° with respect to said first vibratory direction, said resilient portion being formed of two substantially U-shaped spring-like elements, a first leg of each said element being connected to said second portion and the other leg of each U-shaped spring-like elements being connected to said first portion, each leg of each element being formed with a Z-shaped bend away from said opposed surface to which said flat surface is secured so that said other leg of each U-shaped spring-like element connected to said flat surface is in overlapping relationship along the lengthwise extent of said vibrator with said opposed planar surface when said opposed planar surfaces are viewed in plan view to thereby reduce the lateral dimension of said tuning fork vibratory assembly.

4,069,435

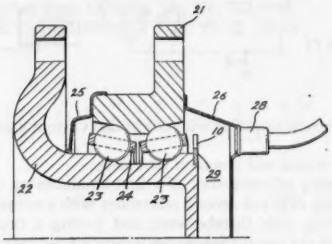
DEVICE FOR DETECTING RELATIVE MOTIONS IN A BEARING

Carl Axel Wannerskog, Goteborg, and Sture Lennart Asberg, Savedalen, both of Sweden, assignors to SKF Industrial Trading and Development Company, N.V., Amsterdam W., Netherlands

Continuation-in-part of Ser. No. 463,973, April 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 243,494, May 26, 1972, abandoned. This application Nov. 12, 1975, Ser. No. 630,970

Int. Cl.[2] H02K *17/42*

U.S. Cl. 310—168 **8 Claims**



1. In a bearing assembly having at least two relatively rotatable bearing members spaced apart to define an annular space for a plurality of rolling elements, a device having means for generating a magnetic medium and means for sensing variation in the magnetic medium, said bearing assembly including means for inducing variations in the magnetic flux which variations have a frequency proportional to the rotational speed of one member relative to the other member, said means for generating variations being associated with one bearing member and seal means including a circumferentially extending shield at opposite axial ends of said annular space, said sensing means mounted in one of said shield members, each of said shields secured to one of said bearing members and in sealing contact with the other bearing member and enclosing an annular space including said rolling elements and said generating and sensing means thereby providing a sealed environment therefor.

4,069,436

FLAT THERMIONIC CATHODE

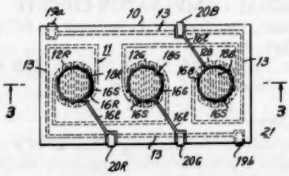
Akira Nakayama, Fuchu; Akio Ohkoshi, Tokyo; Shoichi Muramoto, Tokyo; Takehisa Natori, Tokyo; Koichiro Sumi, Inagi; Hideaki Nakagawa, Ebina, and Torao Aozuka, Chofu, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 8, 1976, Ser. No. 693,905

Claims priority, application Japan, June 11, 1975, 50-70653

Int. Cl.[2] H01J *1/46, 21/10*

U.S. Cl. 313—302 **12 Claims**



1. A flat thermionic cathode, comprising:

a substrate;

sub-heating means provided on said substrate responsive to

an electric current flowing therethrough to substantially define a heating area;

main heating means provided on said substrate within said heating area responsive to an electric current flowing therethrough to produce at least one substantially localized area of heat; and

cathode means disposed at said at least one localized area and including electron emissive material.

4,069,437

INFRARED LAMP WITH HEAT CONDUCTIVE CAP ASSEMBLY AND FIXTURE

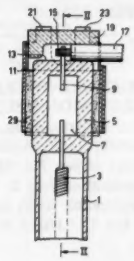
Victor Rosallie Notelteirs; Josephus Franciscus Rijcksert, and Johannes Maria Jozef Ritzen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,551

Claims priority, application Netherlands, Apr. 16, 1975, 7504501

Int. Cl.[2] H01K *7/00*

U.S. Cl. 313—315 6 Claims



1. An electric infra-red incandescent lamp which comprises a hermetically sealed lamp envelope, at least one extremity of said envelope being sealed by a pinch seal; a current lead through extending outside said pinch seal and said envelope; a current conductor connected outside said pinch to said current lead through; a metal sleeve surrounding in circumferentially spaced relation substantially all of the connection between said current lead through and said current conductor as well as said pinch seal; a mass of a readily heat-conducting material substantially filling all of the space between said pinch seal and the interior of said metal sleeve, an electrically insulating member cooperating with said sleeve at the end thereof remote from the lamp envelope, said member surrounding said connection and closing said sleeve.

4,069,438

PHOTOEMISSIVE CATHODE AND METHOD OF USING COMPRISING EITHER CADMIUMTELLURIDE OR CESIUM IODIDE

John M. Houston, Schenectady; James R. Young, Rexford, and Nathan R. Whetten, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

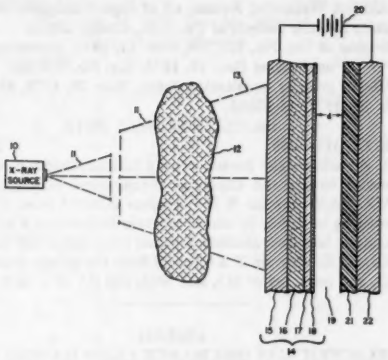
Division of Ser. No. 511,615, Oct. 3, 1974, Pat. No. 3,940,620. This application Sept. 18, 1975, Ser. No. 614,503

Int. Cl.[2] H01J *1/14, 19/06;* H01K *1/04*

U.S. Cl. 313—346 R 6 Claims

1. A photocathode electrode adapted for operation in an oxidizing atmosphere comprising:

a layer of a material selected from the group consisting of cadmium telluride and cesium iodide disposed so as to be impinged on by photons, said photons being substantially



in the ultraviolet spectral region whereby electrons are emitted in response to said photons.

4,069,439

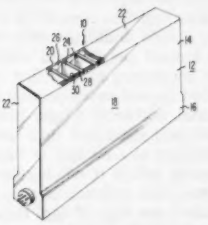
FLAT PANEL DISPLAY WITH BEAM INJECTION CLEANUP

Charles Hammond Anderson, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 2, 1977, Ser. No. 765,109

Int. Cl.[2] H01J *29/08, 29/72, 31/00*

U.S. Cl. 313—422 16 Claims



1. In a display device which includes an evacuated envelope having spaced front and back walls, at least one electron beam focusing guide extending substantially parallel to said front and back walls, said focusing guide having walls which serve to confine therebetween a beam of electrons directed into the focusing guide, and means for generating at least one beam of electrons and directing each beam into a separate focusing guide, the improvement comprising,

electron beam clean-up means between said electron beam generating means and said focusing guide for removing from the generated beam the electrons which are so positioned and have such a velocity vector that if allowed to remain in said beam would impinge on a wall of the said focusing guide during the travel along the focusing guide.

4,069,440
RECORDING MATERIAL

Takeshi Takeda; Fumio Muramatsu, both of Kawasaki, and Akinori Watanabe, Komae, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

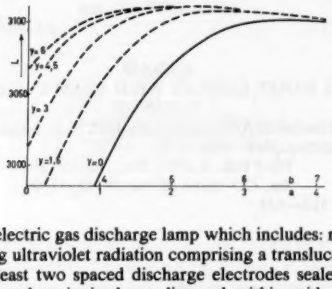
Division of Ser. No. 197,769, Nov. 11, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,124
Claims priority, application Japan, Nov. 25, 1970, 45-104235; Feb. 25, 1971, 46-10050
Int. Cl.[2] H01J *29/12, 29/14*
U.S. Cl. 313—465 3 Claims

1. A cathode ray device using a cathodochromic recording material having the chemical composition $M_6Al_6Si_6O_{24}\cdot 2(1-y)MX\cdot yM_2Z$ wherein X is a member selected from the group consisting of F, Cl, Br and I; wherein M is Na or a mixture of Na and at least one element selected from the group consisting of Li and K; wherein Z is selected from the group consisting of WO_4 and mixtures of SO_4 and WO_4 and $0.1 \leqq y \leqq 0.8$.

4,069,441
ELECTRIC GAS DISCHARGE LAMP HAVING TWO SUPERPOSED LUMINESCENT LAYERS

Willem Lambertus Wanmaker, deceased, late of Eindhoven, Netherlands (by Tomas Lammert Willem Reining, administrator); Lambertus Wilhelmus Johannes Manders, and Johannes Wilhelmus ter Vrugt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 574,348, May 6, 1975, abandoned. This application Sept. 8, 1976, Ser. No. 721,287
Claims priority, application Netherlands, May 6, 1974, 7406035
Int. Cl.[2] H01J *61/46, 61/48*
U.S. Cl. 313—487 8 Claims



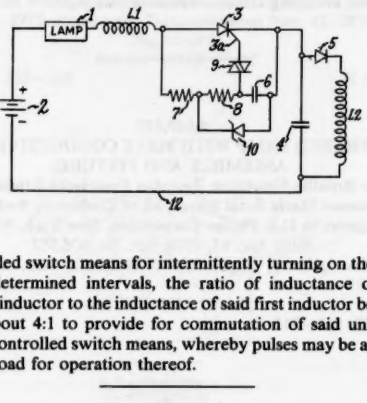
1. An electric gas discharge lamp which includes: means for producing ultraviolet radiation comprising a translucent envelope, at least two spaced discharge electrodes sealed in said envelope and an ionized gas disposed within said envelope, said lamp further comprising at least first and second superposed layers carried on said envelope, said first layer being a luminescent material, said second layer being farther from a discharge between said electrodes than said first layer, said second layer consisting of a mixture of luminescent material and a white material which is non-luminescent and has an absorption for ultraviolet radiation of a wavelength of more than 240 nm which is less than 20% of the absorption of this radiation by that constituent of the luminescent material which has the smallest absorption for this radiation, the ratio of the amount of white material to the amount of luminescent material within any one layer versus any other layer increasing with the distance from the discharge.

4,069,442
PULSED CIRCUIT FOR GASEOUS DISCHARGE LAMPS

Trasimond A. Soileau, Flat Rock, N.C., assignor to General Electric Company

Filed June 2, 1976, Ser. No. 692,080
Int. Cl.[2] H05B *41/30*
U.S. Cl. 315—208 18 Claims

1. A load operating circuit comprising, in combination, a direct current power source, a first inductor, unidirectional controlled switch means and a capacitor connected in series with each other across said power source, a second inductor of higher inductance than said first inductor connected across said capacitor and forming a discharge loop therewith, means for connecting a load across said power source in series with said first inductor and said unidirectional controlled switch means, and control means connected to said unidirectional

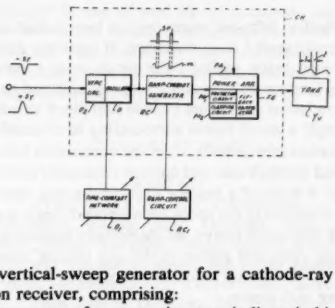


controlled switch means for intermittently turning on the same at predetermined intervals, the ratio of inductance of said second inductor to the inductance of said first inductor being at least about 4:1 to provide for commutation of said unidirectional controlled switch means, whereby pulses may be applied to the load for operation thereof.

4,069,443
INTEGRATED VERTICAL-SWEEP GENERATOR FOR TELEVISION RECEIVER

Luigi Venutti, Monza (Milan), Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

Continuation-in-part of Ser. No. 487,749, July 11, 1974, abandoned. This application July 2, 1976, Ser. No. 702,049
Claims priority, application Italy, July 13, 1973, 26549/73
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—395 10 Claims



1. A vertical-sweep generator for a cathode-ray tube of a television receiver, comprising:

oscillator means for generating a periodic switching pulse to start a recurrent sweep cycle divided into a relatively short retrace period and a relatively long trace period;

a ramp-current generator connected to said oscillator means for producing an output current returning to a base level in response to said switching pulse and varying monotonically from said level upon the termination of said switching pulse;

a source of direct current;

a scanning circuit including a deflection coil and a sweep capacitor in series, said scanning circuit forming a supply path for the feeding of charging current from said source via said coil to said sweep capacitor and a discharge loop for passing reverse current from said sweep capacitor through said coil;

amplifier means in said scanning circuit for regulating said charging and reverse currents under the control of said output current;

electronic switch means controlled by said oscillator means

for temporarily blocking the flow of reverse current in said discharge loop at the end of a sweep cycle and starting the retrace period of a new cycle in response to said switching pulse;

capacitive storage means chargeable by said source and connected to said scanning circuit for receiving residual reverse current from said sweep capacitor in a first part of said retrace period, upon a blocking of said discharge loop by said switch means, and delivering a charging current via said supply path to said sweep capacitor in a second part of said retrace period; and

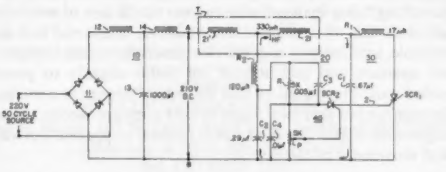
clamping means responsive to a voltage difference between said source and said storage means for maintaining the blocking of said discharge loop over a period exceeding the duration of said switching pulse until the disappearance of said voltage difference, due to the flow of said charging current, at the end of the retrace period.

4,069,444

ULTRASONIC POWER GENERATOR

Richard C. Heim, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 1, 1976, Ser. No. 691,675
Int. Cl.[2] H02K *33/00*
U.S. Cl. 318—114 **1 Claim**



1. In an ultrasonic power generator adapted for operation under a 110 volts, 60 cycle standard power supply comprising a constant current source having input terminals for coupling with said standard 110 volts power supply and output terminals for delivering constant current under a voltage related to the voltage at said input terminals, a switching thyristor responsive to said related voltage, a transducer coil for converting high frequency electrical power into acoustic energy at a desired power output and operating frequency; an LC oscillating network including a main capacitor and the impedance of said transducer coil, the resonant frequency of said oscillating network corresponding to said operating frequency; a resonant charging network including said switching thyristor and said main capacitor and a triggering circuit for gating said switching thyristor to charge said main capacitor at the rate of said high frequency electrical power, the combination of:

said input terminals being adapted for coupling with a standard 220 volts, 50 cycle power supply;

said main capacitor having a capacitance reduced in proportion to the voltage ratio between said related voltage for a standard 110 volt power supply to the related voltage for a standard 220 volt power supply, and increased in proportion to the high frequency circulating current required in said LC oscillating network to cause, under said 220 volt standard power supply, an increase of said related voltage to generate substantially said power output, said increase being within the voltage constraints of said switching thyristor; and

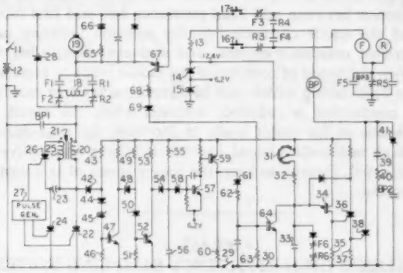
a high Q inductance added to said LC network in order to match the required resonant frequency.

4,069,445

BYPASS CONTROL FOR A SOLID STATE SWITCHING DEVICE

Robert G. Klimo, Parma, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Oct. 28, 1975, Ser. No. 626,504
Int. Cl.[2] H02P *7/28*
U.S. Cl. 318—139 **14 Claims**



1. In a system for controlling the power delivered from a source of direct current to a load including a silicon controlled rectifier connected in series with said source of direct current and said load, a pulse generator for repeatedly gating the silicon controlled rectifier into conduction at a controlled rate, a commutation circuit for commutating the silicon controlled rectifier at a controlled time after the silicon controlled rectifier is gated into conduction, a by-pass relay having main contacts for connecting said load directly to said source of direct current when said relay is energized, the improvement comprising:

a. a circuit for energizing said bypass relay,

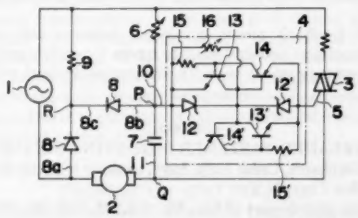
b. means responsive to the state of conduction of said silicon controlled rectifier for disabling said circuit (a) in the event said silicon controlled rectifier fails to be gated into conduction by said pulse generator.

4,069,446

SPEED CONTROL MEANS FOR AC MOTOR

Hiroshi Yonehara, Oizumi, Japan, assignor to Sanwa Chemical Co., Ltd., Japan

Filed Nov. 12, 1975, Ser. No. 631,462
Claims priority, application Japan, Nov. 30, 1974, 49-137933; Sept. 29, 1975, 50-117995
Int. Cl.[2] H02P *3/02*
U.S. Cl. 318—466 **5 Claims**



1. A speed control means for an AC motor comprising:

a bi-directional rectifier adapted to be connected in series with an AC motor and a power source;

a control circuit connected in parallel with said bi-directional rectifier and having a variable resistance element and a capacitor connected in series, the side of said capacitor opposite the side connected to said variable resistance element being adapted to be connected to one side of said motor;

an unbalanced switching circuit connected between the gate

terminal of said bi-directional rectifier and the junction between said variable resistance element and said capacitor and having different absolute values of positive and negative switching voltages;

a fixed resistance and a first diode connected in series and being adapted to be connected in parallel with said power source, the anode of said first diode being adapted to be connected to the other side of said AC motor; and

a second diode havng the cathode thereof connected to the junction between said fixed resistance and said first diode and the anode connected to the junction between said variable resistance element and said capacitor, whereby when the speed of rotation of the motor tends to increase, the time during which said bi-directional control rectifier is conductive is reduced, whereas when the speed of rotation of the motor tends to decrease, the time during which said bi-directional control rectifier is conductive is increased, thereby to keep the rotary speed of said motor constant.

4,069,447

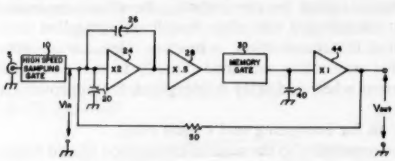
STABILIZED HIGH-EFFICIENCY SAMPLING SYSTEM

George Joseph Frye, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 321,877, Jan. 8, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,797

Int. Cl.[2] H02J *15/00*; G11C *11/24*

U.S. Cl. 320—1 **9 Claims**



1. A sampling system comprising:

sampling gate means for collecting instantaneous voltage values of an input signal,

first storage means for first storing said instantaneous voltage values,

first feedback means connected to said first storage means for enabling said first storage means to respond precisely to said instantaneous voltage values,

second storage means for second memory storage of said instantaneous voltage values,

memory gate means for transferring said instantaneous voltage value from said first storage means to said second storage means,

an output terminal connected to said second storage means, and

second feedback means connected between said output terminal and said first storage means for maintaining said first storage means at said instantaneous voltage values.

4,069,448

THREADED FASTENER MOUNTING MEANS

Paul D. Gernhardt, Cedar Falls, Iowa, assignor to Slater Electric Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 624,044, Oct. 20, 1975, abandoned. This application Aug. 3, 1976, Ser. No. 711,146

Int. Cl.[2] H02G *3/08*; F16B *37/02*

U.S. Cl. 220—3.2 **40 Claims**

1. Threaded fastener mounting means, which comprises:

a screw mounting member including a backwall and generally continuous sidewall means upstanding from said backwall, said sidewall means defining a generally open front face at its front edge opposite said backwall;

boss means formed on at least one portion of said sidewall means, said boss means including:

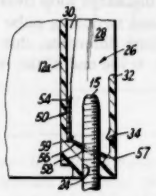
a lug formed essentially at said front end, said lug having an unthreaded borehole extending rearwardly from said front face for receiving a threaded fastener, and

a slotted channel of relatively enlarged width behind said lug, into which said borehole opens, said channel including slot means;

threaded fastener quick-fastening means slidably and lockably receivable in each said slotted channel, said quick-fastening means comprising a generally V-shaped clip member which includes:

a first leg receivable in said slot means,

a second leg forming a generally obtuse angle at the vertex of intersection with said first leg and having an aperture formed therein for receiving said threaded fastener, and



detent means formed on said first leg for lockably securing said clip member in said slot means when said clip member is fully seated in said slot means substantially adjacent said back end of said lug;

said clip member being lockably seated in place by said detent means, with said vertex substantially abutting said lug and said aperture essentially in registration with said borehole, said second leg being inclined with respect to the axis of said borehole such that when said threaded fastener is inserted into said borehole, said fastener engages two generally opposed edges of said aperture and said second leg yields slightly to permit inward axial movement of said threaded fastener in a ratchet-like manner but said two edges of said aperture wedge against projections of said threaded screw fastener to prevent outward axial movement of the fastener.

4,069,449

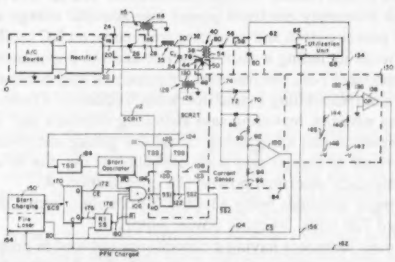
FLYBACK TYPE POWER SUPPLY

Robert P. Farnsworth, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 3, 1976, Ser. No. 654,817

Int. Cl.[2] H02M *3/315*

U.S. Cl. 363—28 **17 Claims**



1. A power supply circuit supplying power to a capacitive load comprising:

a source of current,

a first resonant charging circuit coupled to said source and including first switching means,

a second resonant charging circuit including second switching means coupled to said first resonant circuit, and

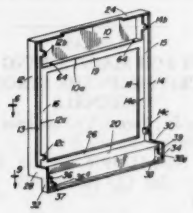
third switching means for coupling energy from said second resonant circuit to said load.

4,069,450

KNOCKDOWN CABINET HAVING A COMBINATION DOOR FRAME AND FRONT WALL

James J. Palka, Arlington Heights, Ill., assignor to General Bathroom Products Corporation, Elk Grove Village, Ill.

Filed Jan. 19, 1977, Ser. No. 760,758
Int. Cl.[2] A47B 47/04
U.S. Cl. 312—257 R 8 Claims



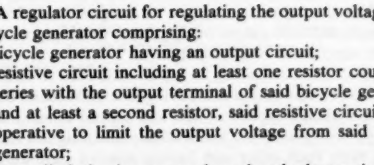
1. A knockdown cabinet having side, rear and bottom walls, a combination one-piece door frame and front wall, and doors for said frame, said combination front wall and door frame being plastic molded in one piece and comprising a narrow top wall, outer side walls and a bottom wall, said bottom wall being wide, inner walls spaced from each of said walls to form grooves whereby the forward free ends of the side walls of the cabinet seat therein, a plurality of spaced perforated ears extending from the free edges of said inner side wall, said cabinet side walls having a series of perforations therein in opposed relationship with the perforations in each of said ears, means to secure said cabinet side walls to said ears, means for pivoting said doors in said frame, and means for positively positioning said doors in closed position and providing for the ready removal and replacement of said doors.

4,069,451

BICYCLE GENERATOR CIRCUIT

Paul S. Rouse, 103 N. Santa Anita Ave., Arcadia, Calif. 91006

Filed Apr. 5, 1976, Ser. No. 673,909
Int. Cl.[2] H02J 7/14
U.S. Cl. 322—1 4 Claims



1. A regulator circuit for regulating the output voltage from a bicycle generator comprising:

a bicycle generator having an output circuit;

a resistive circuit including at least one resistor coupled in series with the output terminal of said bicycle generator and at least a second resistor, said resistive circuit being operative to limit the output voltage from said bicycle generator;

a zener diode having an anode and cathode terminal with said cathode terminal being coupled to said second resistor of said resistive circuit to reduce the output voltage of said bicycle generator, said zener diode and said second resistor being coupled across said input terminal and being operative to reduce high peaks of the output voltage from the generator;

a rectifier having an anode and cathode with said anode coupled through said resistive circuit to said cathode of said zener diode, said rectifier being operative to rectify the output voltage from the generator; and

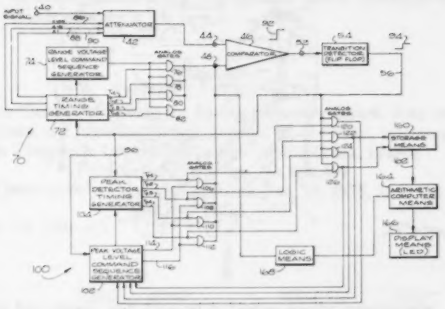
capacitor circuit means coupled to the output of said rectifier circuit means for smoothing and filtering of said output voltage to thereby provide a regulated smooth output voltage.

4,069,452

APPARATUS FOR AUTOMATICALLY DETECTING VALUES OF PERIODICALLY TIME VARYING SIGNALS

Arch W. Conway, Mission Viejo, and Nelson Urdaneta, La Verne, both of Calif., assignors to Dana Laboratories, Inc., Irvine, Calif.

Filed Sept. 15, 1976, Ser. No. 723,393
Int. Cl.[2] G01R 19/16; H03K 5/20
U.S. Cl. 324—103 P 15 Claims



1. Apparatus having a plurality of ranges for automatically detecting the peak values of an applied unknown electrical signal the magnitude of which varies as a function of time comprising:

A. comparator means having first and second input terminals and an output terminal;

B. means for applying said unknown signal to said first input terminal of said comparator means;

C. detector means connected to said output terminal for providing detection signals responsive to output signals from said comparator;

D. means for generating a plurality of voltage levels, each representative of a predetermined range of said apparatus, each of said voltage levels having a sequentially changing direct-current voltage, said changes occurring in predetermined equal increments, means for applying said voltage levels to said second input terminal of said comparator, thereby to provide a reference level signal against which said unknown signal is compared;

E. said comparator means providing a first signal at the output terminal thereof in response to a first predetermined relationship between said reference level signal and said unknown signal representative of one peak of said unknown signal and a second signal at the output terminal thereof responsive to a second predetermined relationship between said reference level signal and said unknown signal representative of the other peak of said unknown signal, said voltage level signals being applied to said second terminal of said comparator consecutively from the level representative of the largest range of said apparatus to the level representative of the lowest range of said apparatus in the absence of a detection signal responsive to said first output signal.

4,069,453

TRANSISTOR TEST FIXTURE

Cornelis Teunis Veenendaal, Cornelius, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 23, 1977, Ser. No. 771,233
Int. Cl.[2] G01R 31/22
U.S. Cl. 324—158 F 8 Claims

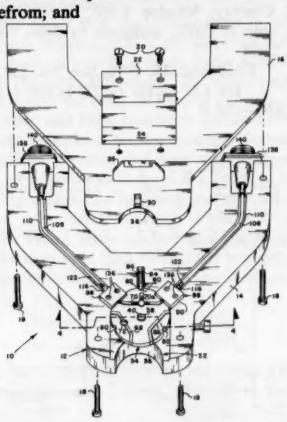
1. A transistor test fixture for testing transistor means, comprising:

housing means having a disc-receiving area;

coaxial connector means provided by said housing means adjacent said disc-receiving area;

disc means having reference circuit means and data circuit means thereon, said disc means positionable within said disc-receiving area;

retaining means provided by said housing means and said disc means for retaining said disc means within said disc-receiving area and to permit said disc means to be removed therefrom; and



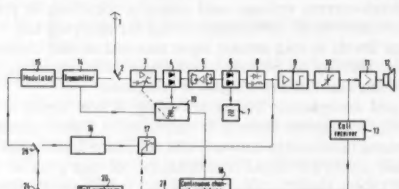
maintaining means provided by said disc means and said housing means for maintaining said disc means in a selected position so that said reference circuit means or said data circuit means is electrically connected to said coaxial connector means.

4,069,454

TRANSMITTER-RECEIVER EMPLOYING AUTOMATIC CHANNEL HUNTING AND SELECTION

Heinz Winkelmann, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 552,638, Feb. 24, 1975, abandoned. This application Mar. 25, 1976, Ser. No. 670,285
Claims priority, application Germany, Feb. 27, 1974, 2409375
Int. Cl.² H04B *1/40*
U.S. Cl. 325—25 **5 Claims**



1. A channel hunting and selection system for a two-way transmitter-receiver combination of the type wherein the receiver operates over a selected one of a plurality of given RF channels, said receiver having a mixer for receiving RF signals and the output of a variable frequency local oscillator to provide a first IF signal output indicative of said channels, and said receiver having a demodulator for detecting the output of said mixer to provide the information bearing modulation signal of a modulated IF signal, said system comprising, in combination:

a second local oscillator for providing a second IF signal the frequency of which is substantially equal to the frequency of said first IF signal;

means for modulating said second IF signal with a given address signal;

means for coupling said modulated second IF signal with said first IF signal at the output of said mixer and at a predetermined level above the noise level of said first IF signal;

means coupled to the detected output of said receiver for detecting said given address signal and when the level of said second IF signal significantly exceeds the level of said first IF signal for providing an idle-channel output signal indicative thereof; and,

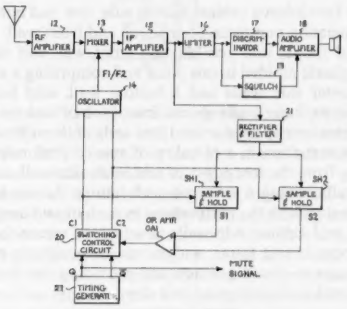
means responsive to said idle-channel output signal for controlling said variable frequency local oscillator to a fixed frequency corresponding to a selected one of said given channels.

4,069,455

ARRANGEMENT FOR MAINTAINING RECEPTION OF A RADIO RECEIVER ON THE STRONGER OF TWO SIGNALS

Ralph R. Sherman, Jr., Forest, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Nov. 11, 1976, Ser. No. 740,825
Int. Cl.² H04B *1/32*
U.S. Cl. 325—469 **6 Claims**



1. For use in a radio receiver, an improved arrangement for causing said receiver to be receptive to the stronger of two radio frequency signals, said arrangement comprising:

a. first and second sample and hold circuits having first and second signal inputs for sampling and holding signals indicative of the strength of signals received by said receiver, having first and second outputs, and having first and second control inputs for controlling the sampling times of said first and second sampling inputs respectively;

b. a comparison circuit having first and second inputs connected to said first and second outputs respectively of said sample and hold circuits and having an output for producing a first output signal in response to a signal at said first sample and hold output being greater than a signal at said second sample and hold output, and for producing a second output signal in response to a signal at said second sample and hold output being greater than a signal at said first sample and hold output;

c. a control circuit having an input connected to said comparison circuit output and having first and second outputs for producing repetitive first and second control signals respectively, said first and second control signals alternating with each other and having relative time durations that are controlled as a function of said first and second output signals produced by said comparison circuit;

d. means connected between said control circuit outputs and said sample and hold circuit control inputs for controlling the sampling times as a function of said first and second control signals;

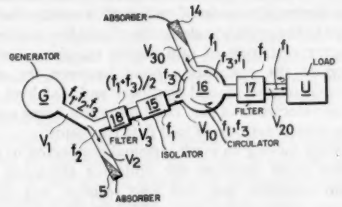
e. means connected between said control circuit outputs and said sample and hold circuit control inputs for controlling the sampling times as a function of said first and second control signals;

f. and means connected to said control circuit outputs for controlling the frequency and time duration of reception of said radio receiver as a function of said first and second control signals.

4,069,456
MICROWAVE SYSTEMS FOR ELIMINATING SPURIOUS SIGNALS FROM PULSED SOURCE

Andre Bensussan, and Claude Levaillant, both of Paris, France, assignors to C.G.R. MeV, France

Filed Mar. 19, 1976, Ser. No. 668,654
Claims priority, application France, Mar. 21, 1975, 75 08947
Int. Cl.[2] H03H *7/04*
U.S. Cl. 328—165 **7 Claims**

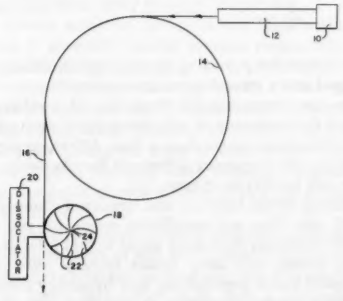


1. A selective transmission system for transmitting pulsed H.F. signals emitted by an H.F. generator and designed for injection into a load device, said H.F. generator being capable of emitting a first signal known as the main signal, of given frequency, and at least one second signal which is a spurious signal, said selective transmission system comprising means for eliminating said spurious signal and selectively transmitting to said load device said first signal and further means for presenting to the H.F. generator a matched load impedance throughout the time of the pulse, said further means comprising at least an hyperfrequency unidirectional element of the isolator type, said selective transmission system further comprising at least a three-channel junction having a first channel receiving said signals of frequency f_1 (main signal) and f_2 (spurious signal) emitted by said generator, a second channel which is equipped at its end with a microwave absorber and means for the selective transmission of the spurious signal of frequency f_2 to said absorber, and a third channel which is provided with a band-pass filter centered on said main frequency f_1, and with said hyperfrequency unidirectional element centred on said main frequency f_1, said third channel being connected to said load device, said second channel being constituted by a waveguide which is a cut-off waveguide in relation to said main signal.

4,069,457
HIGH-ENERGY ACCELERATOR FOR BEAMS OF HEAVY IONS

Ronald L. Martin, La Grange, and Richard C. Arnold, Chicago, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 17, 1977, Ser. No. 769,822
Int. Cl.[2] G21B *1/00*; H05H *13/04*
U.S. Cl. 328—235 **11 Claims**



1. An apparatus for striking a target with a beam of heavy ions having atomic masses greater than 100, the apparatus comprising:

a. a source of uniquely ionized ions of a mass greater than 100;

b. means for accelerating the uniquely ionized ions to a high energy;

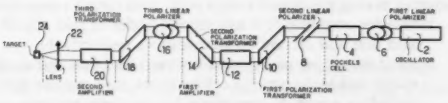
c. means for storing the accelerated ions at the energy; and

d. means for extracting the accelerated ions into a plurality of beams and directing the beams to arrive substantially simultaneously at the target.

4,069,458
POWER LASER CHAIN

Jean-Claude Farcy, Briis sur Forges; Genevieve Girard, Jouy en Josas, and Maurice Michon, Draveil, all of France, assignors to Compagnie General d'Electricite, Paris Cedex, France

Filed Dec. 1, 1975, Ser. No. 636,497
Claims priority, application France, Jan. 15, 1975, 75.01173
Int. Cl.[2] H01S *3/10*
U.S. Cl. 330—4.3 **3 Claims**



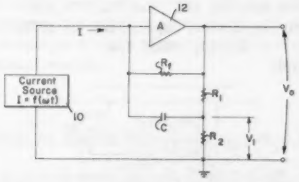
1. In a laser chain including means for generating a circularly polarized laser beam and a plurality of amplifier elements on the path of the laser beam for passage of said laser beam therethrough, the improvement comprising:

means for optically isolating successive amplifier elements, said optically isolating means comprising in series on the path of the laser beam and between said amplifier elements, a linear polarizer between two passive transformers of the type transforming a linear polarization into a circular one and vice versa.

4,069,459
FEEDBACK CAPACITOR DIVIDER

J. Spencer Lee, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 23, 1976, Ser. No. 716,929
Int. Cl.[2] H03F *1/36*
U.S. Cl. 330—107 **2 Claims**



1. A compensation network for reducing peaks in the output level versus frequency performance characteristics of an amplifier, comprising the combination:

a first resistor one end of which is connected to the output of the amplifier;

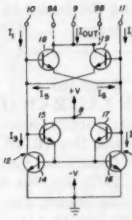
a second resistor one end of which is joined to the other end of the first resistor and the other end of said second resistor is at ground potential; and

capacitively reactive means, connected between the input of the amplifier and the joined ends of the first and second resistors, for providing a reactance of at least ten times the ohmic value of the first and second resistors in parallel.

4,069,460
CURRENT COMPARATOR CIRCUIT

Don R. Sauer, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 30, 1976, Ser. No. 728,110
Int. Cl.² H03F 3/45
U.S. Cl. 330—257 **5 Claims**



1. A symmetrical current comparator circuit for responding to the difference between first and second current sources, said sources having a common return point, said circuit comprising:

means for coupling first and second nodes of said circuit to said first and second current sources respectively;

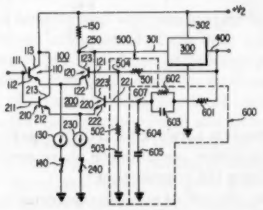
current mirror means coupled between said first and second nodes and said common return point, said current mirror including a pair of transistors having their emitters coupled together and to said common return point, their bases coupled together, and their collectors coupled respectively to said first and second nodes, and level shifting means coupled from each of said collectors of said pair to said bases of said pair, said current mirror acting to force equality between the currents flowing in said first and second nodes; and

first and second output transistors each having an emitter, a base, and a collector, the base of said first output transistor and the emitter of said second output transistor being coupled to said first node, the base of said second output transistor and the emitter of said first output transistor being coupled to said second node whereby the collectors of said output transistors constitute the output of said circuit.

4,069,461
AMPLIFIER CIRCUIT HAVING TWO NEGATIVE FEEDBACK CIRCUITS

Jun Sano, Machida, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanawaga, Japan

Filed Mar. 14, 1977, Ser. No. 777,359
Claims priority, application Japan, Mar. 19, 1976, 51-29296
Int. Cl.² H03F 3/45
U.S. Cl. 330—260 **4 Claims**



1. An amplifier circuit having two negative feedback circuits of different negative feedback ratios comprising:

an amplifier circuit input terminal;

an amplifier circuit output terminal;

a first semiconductor differential amplifier including first and second transistors, having base, emitter and collector electrodes respectively, the emitter electrodes of the first and second transistors being connected to each other, and the base electrode of said first transistor being connected to said amplifier circuit input terminal; a load resistor; and means for connecting said load resistor between the collector electrode of the second transistor and a reference potential source;

a second semiconductor differential amplifier including third and fourth transistors, having base, emitter and collector electrodes respectively, the emitter electrodes of said third and fourth transistors being connected to each other, the collector electrode of said third transistor being connected to the collector electrode of said first transistor, the collector electrode of said fourth transistor being connected to the connection point between the collector electrode of said second transistor and said load resistor, the base electrode of said third transistor being connected to the base electrode of said first transistor;

an amplifier having an input terminal connected to the connection point between the collector electrode of said second transistor and said load resistor, and an output terminal connected to said amplifier circuit output terminal;

a first negative feedback circuit connected between the output terminal of said amplifier and the base electrode of said second transistor;

a second negative feedback circuit connected between the output terminal of said amplifier and the base electrode of said fourth transistor;

first switching means;

means for connecting said first switching means between the common emitter electrodes of said first and second transistors and a reference potential source;

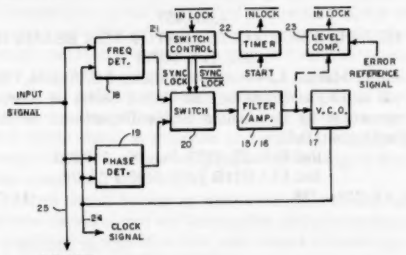
second switching means; and

means for connecting said second switching means between the common emitter electrodes of said third and fourth transistors and a reference potential source.

4,069,462
PHASE-LOCKED LOOPS

David Dunn, Windham, N.H., assignor to Data General Corporation, Southboro, Mass.

Filed Dec. 13, 1976, Ser. No. 750,288
Int. Cl.² H03B 3/04
U.S. Cl. 331—11 **8 Claims**



1. A system for providing in phase synchronism between a first signal and a second signal comprising

means for comparing the frequency of a reference signal with the frequency of a feedback signal derived from said second signal to produce a first difference signal representing the frequency difference therebetween;

filter and amplifying means;

switching means between said frequency comparing means and said filter and amplifying means for supplying said first frequency difference signal to said filter and amplifying means, said latter means thereby providing a first control signal representing said frequency difference;

oscillator means responsive to said first control signal for producing said second signal, the frequency of said second

signal being controlled by said first control signal so that said frequency difference is minimized so that the frequency of said feedback signal derived from said second signal is in substantial synchronism with the frequency of said reference signal;

means for comparing the phase of said second signal with the phase of said first signal to produce of second difference siganl representing the phase difference therebetween;

means for actuating said switching means to supply said second phase difference signal to said fixed filter and amplifying means and to prevent said first frequency difference signal from being supplied thereto when said substantial frequency synchronism has been achieved, said filter and amplifying means thereby providing a second control signal;

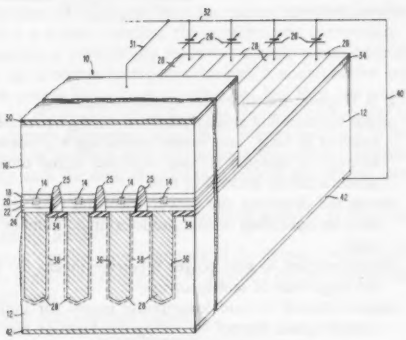
said oscillator means being responsive to said second control signal so that said phase difference is minimized and the phase of said second signal is in substantial in-phase synchronism with the phase of said first signal.

4,069,463

INJECTION LASER ARRAY

James Cleary McGroddy, Putnam Valley, and Peter Stephen Zory, Jr., Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,793
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 P **6 Claims**



1. An injection laser array package comprising:

a single crystal substrate having in one surface thereof a plurality of generally parallel grooves respectively filled with metallic substance to provide a plurality of electrically conductive heat sinks, the walls of said grooves being defined respectively by intrinsic facet planes in said substrate along which the substrate material is precisely removed and having the property of electrically isolating from each other the heat sinks respectively positioned therein, the depth of each groove being large in comparison with its width, and

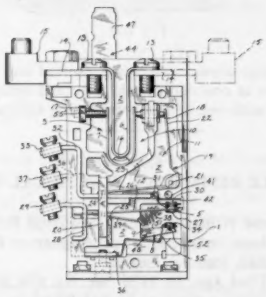
an array of injection lasers mounted upon said substrate with the individual lasers of said array respectively contacting said heat sinks directly, each of said lasers having a controllable active side which is in both a thermally and electrically conductive relationship with the respective heat sink.

4,069,464

BIMETAL OVERLOAD RELAY

Parker A. Bollinger, Jr., Franklin, and Norbert F. Frymark, Glendale, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Aug. 19, 1976, Ser. No. 715,681
Int. Cl.[2] H01H *61/02*
U.S. Cl. 337—77 **3 Claims**



1. A bimetal overload relay, the combination comprising:

a case made of an insulating material and defining a first compartment and a second compartment separated by a wall;

a heater unit disposed in said first compartment and being electrically connectable to conduct current in a circuit;

a bimetal disposed in said first compartment and being responsive to changes in temperature therein to change shape;

an electrical switch disposed in said second compartment and being electrically connectable to a second circuit and mechanically operable between an unactuated and an actuated state;

a pin slidably received in an opening formed in said wall to communicate with both of said compartments and to engage said bimetal; and

coupling means disposed in said second compartment and mounted to said case for rotation about an axis to couple the sliding motion of said pin to said electrical switch and to thereby actuate said electrical switch when said coupling means rotates a preselected amount, and

in which said coupling means includes two legs which extend radially outward from said axis to define an angle therebetween and one of said legs is a bimetal which is responsive to temperature, wherein one of said legs engages said pin and the other of said legs is coupled to said electrical switch.

4,069,465

CYLINDRICAL VARISTOR AND METHOD OF MAKING THE SAME

Allan V. Kouchich, Milwaukee, and Robert Marshall, Mequon, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed July 12, 1976, Ser. No. 704,156
Int. Cl.[2] H01C *7/10*
U.S. Cl. 338—20 **20 Claims**

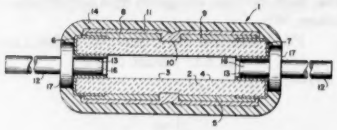
1. A varistor, the combination comprising:

a cylindrical core made of a sintered varistor material, and having openings at its opposite ends and an outer longitudinal surface;

a pair of terminating layers, one being on each end of said core;

an electrode film on the outer longitudinal surface of said core between said terminating layers, said electrode film being divided into a pair of electrode portions by a gap;

each of said electrode portions being in communication with one of said terminating layers; and



a pair of lead wires, each being inserted into an opening of said core at one end of said core and being in electrical contact with one of said terminating layers.

4,069,466
VARIABLE RESISTANCE ELECTRICAL CONTROL UNITS

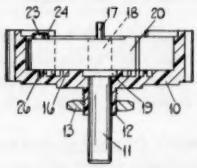
Charles Norman Williams, Solihull, and Hugh Roberts, Whalley near Blackburn, both of England, assignors to R. & D. Instruments Limited, Ramsey, England

Filed Apr. 19, 1976, Ser. No. 678,232

Claims priority, application United Kingdom, Apr. 19, 1975, 16257/75

Int. Cl.² H01C *10/24*

U.S. Cl. 338—147 **7 Claims**



1. An electrical control unit, comprising an electrical circuit portion of a resistive electrically conducting material formed on a support in a spiral configuration, a spindle mounted for rotation about the centre of the spiral and having a non-circular portion, an arm having a longitudinally extending slot non-rotatably engaged on the non-circular portion of the spindle to provide for sliding movement of the arm relative to the spindle and radially with respect to the axis thereof, an electrical contact carried on the arm to move radially therewith, to make contact with said circuit portion, and a spiral guide means aligned with the circuit portion spiral and co-operable with the arm to guide said arm radially so that the electrical contact follows the circuit portion spiral to alter the effective electrical resistance thereof in use.

4,069,467
SUPPRESSION OF OUT-OF-FOCUS ECHOES IN ULTRASONIC SCANNING

Christoph Benedikt Burckhardt, Muttenz; Pierre-Andre Grandchamp, Munchenstein, both of Switzerland, and Heinz Hoffmann, Grenzach, Germany, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

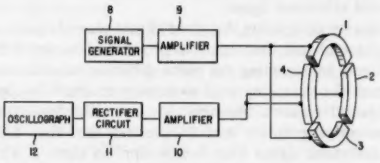
Filed Apr. 7, 1976, Ser. No. 674,465

Claims priority, application Switzerland, Apr. 18, 1975, 4988/75

Int. Cl.² G01S *9/66*

U.S. Cl. 340—1 R **6 Claims**

1. A method of reducing the echoes from reflectors disposed outside the focal line in an echo-sounding process using an ultrasonic field focusing in a focal line, which method comprises transmitting a pulsed ultrasonic wave having a cross-sectional area corresponding to one or more annular segments having a total azimuth angle of less than 360°, receiving echoes from the spatial region corresponding to at least a part of other annular segments which complement the annular segments of the cross-sectional area of the transmitted ultrasonic pulse to form a complete ring, and amplifying echo signals corresponding to the received echoes, rectifying the amplified echo signals and displaying the rectified echo signals, the said steps of amplifying, rectifying and displaying being carried out without any interruption between them.



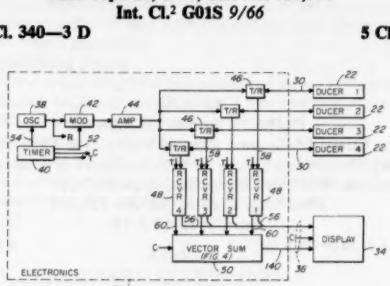
4,069,468
DOPPLER SPECTRAL MEASUREMENT

James F. Bartram, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 24, 1976, Ser. No. 726,344

Int. Cl.² G01S *9/66*

U.S. Cl. 340—3 D **5 Claims**



1. A Doppler measurement system comprising:

means for sampling a signal received during a predetermined interval of time, said means providing a predetermined number of samples of said received signal during said predetermined interval of time;

means for obtaining the power spectrum of a set of said samples consisting of said predetermined number of samples;

means coupled to said power spectrum means for forming the logarithm of said spectrum;

means coupled to said logarithmic means for multiplying output signals thereof by orthogonal function factors; and

means coupled to said multiplying means for combining products of said multiplying means to produce a component of a Doppler frequency.

4,069,469
SYSTEM FOR COLLECTING INFORMATION IN WATER

Yosimura Masaharu, Tokyo, Japan, assignor to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Sept. 23, 1976, Ser. No. 725,878

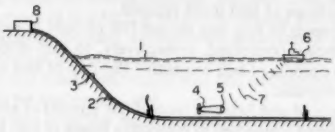
Claims priority, application Japan, Oct. 15, 1975, 50-124131

Int. Cl.² H04B *11/00*

U.S. Cl. 340—5 R **4 Claims**

1. A system for collecting information in water comprising a signal cable laid under water connected to a control unit on land, said cable having a plurality of hydrophones at every predetermined length, a submersible which can automatically move under water according to the control of said control unit through said cable, said submersible being acoustically con-

nected to said cable, said submersible having a sensor for collecting the information in water, and said information collected



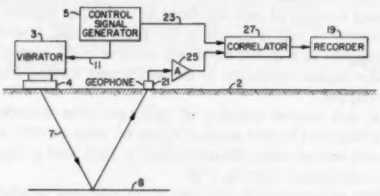
by the sensor being forwarded to said control unit on land through said cable.

4,069,470

USE OF PERIODIC SIGNALS FOR CONTINUOUS WAVE SEISMIC PROSPECTING

Allen B. Cunningham, and Edward T. Miller, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed July 26, 1976, Ser. No. 708,675
Int. Cl.[2] G01V 1/14
U.S. Cl. 340—15.5 TA **6 Claims**



1. In a method of seismic prospecting wherein a vibratory seismic signal is transmitted into the earth from a first location and reflections of the signal from the subsurface are thereafter detected at a second location, the improvement comprising:

transmitting a periodically repetitive seismic signal wherein the signal within each period thereof is nonrepetitive and each period has a time duration not less than the travel time of the seismic signal from the transmitting location to the deepest subsurface location of interest and back to the detecting location, said signal being transmitted continuously until the desired amount of seismic energy has been transmitted at a location;

detecting reflections of the transmitted signal at at least one detecting location;

summing together time segments of the detected signal, said time segments being equal to a period of the transmitted signal; and

recording said summed signal.

4,069,471

METHOD OF DETERMINING WEATHERING CORRECTIONS IN SEISMIC RECORD PROCESSING

Daniel Silverman, Tulsa, Okla., assignor to Geophysical Systems Corporation, Pasadena, Calif.

Filed Mar. 12, 1976, Ser. No. 666,359
Int. Cl.[2] G01V 1/36
U.S. Cl. 340—15.5 TC **20 Claims**

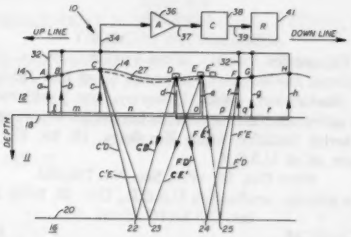
1. In a seismic system having a linear array of receiver positions, A, B, C, and F, G, H, etc. and closely-spaced source positions D, E, therebetween, the method of determining the differential static correction through the weathered layer at source positions D and E, comprising the steps of:

a. recording a first record from source point D to receivers C, upline, and F, downline, from source D.

b. recording a second record from source point E to receivers C, up line, and F, downline, from source E;

c. correlating a first pair of traces DF and EF to provide a first time difference R between said first two traces;

d. correlating a second pair of traces EC and DC to provide



a second time difference S between said second pair of traces; and

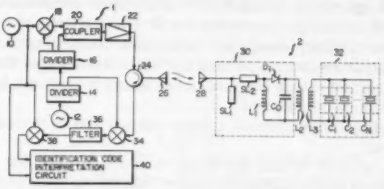
e. determining $K_1 = (R - S)/2$, where K_1 is the first value of differential static correction at source points D and E.

4,069,472

FOREGROUND SUBJECT-IDENTIFYING APPARATUS

Shohichi Kamata; Yoshinori Kimura, both of Yokohama, and Johji Sakuragi, Hachioji, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 22, 1976, Ser. No. 753,530
Claims priority, application Japan, Dec. 25, 1975, 50-156931; Dec. 25, 1975, 50-156932; Aug. 3, 1976, 51-92456
Int. Cl.[2] G01S 9/56
U.S. Cl. 340—146.3 K **13 Claims**



1. A foreground subject-identifying apparatus which comprises a first signal-generating means for producing a first signal having a plurality of frequencies falling within a prescribed range; second signal-generating means for sending forth a second signal having a higher frequency than the first signal; first frequency mixing means for mixing output signals from the first and second signal-generating means and modulating the second signal by the first signal to produce a modulated signal; first transmission and reception means for transmitting an output signal from the first frequency mixing means; second transmission and reception means for receiving a signal sent forth from the first transmission and reception means; coding means provided with at least one resonance circuit to generate a coded signal corresponding to the frequency of said resonance circuit; a nonlinear circuit provided with a nonlinear element, coupled between the second transmission and reception means and coding means, and adapted to detect a signal issued from the second transmission and reception means to supply the coding means with a signal corresponding to the first signal, and modulate a signal corresponding to the second signal by a coded signal from the coding means to deliver a modulated signal to the second transmission and reception means; second frequency-mixing means for mixing an output signal from the second signal-generating means with a signal emitted from the second transmission and reception means and received through the first transmission and reception means; a third frequency-mixing means for mixing a first signal produced from the first signal generating means and an output signal from the second frequency-mixing means, thereby gen-

erating a signal corresponding to the coded signal; and a coded signal-interpreting circuit for judging the coded signal from an output signal of the third frequency-mixing means.

4,069,473

ASSOCIATIVE MEMORY

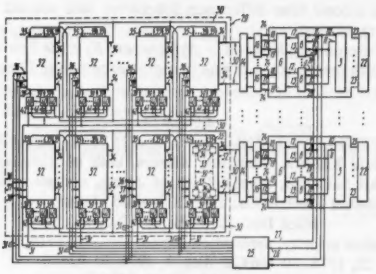
Georgy Viktorovich Vitaliev, ulitsa Vavilova, 39, kv. 17, Moscow; Alexei Davidovich Gvinepadze, ulitsa Lva Tolstogo, 27, kv. 8, Moskovskaya oblast, Ljubertsy; Rem Vasilievich Smirnov, 3 mikroraion Teplogo Stana, korpus 32, kv. 36, and Gury Dmitrievich Sofiisky, ulitsa Kazakova, 18, kv. 67, both of Moscow, all of U.S.S.R.

Filed Oct. 14, 1976, Ser. No. 732,202

Claims priority, application U.S.S.R., Oct. 28, 1975, 2181752

Int. Cl.[2] G11C *15/00*

U.S. Cl. 365—49 **6 Claims**



1. An associative memory designed to perform search and logical operations on attributive information presented in the form of multi-digit associative words which are sets of a given number of binary associative indications, comprising

an input register to receive and store the code of the first operand, which is a given set of binary indications, having control outputs and

flip-flops with an input, a direct output, and an inverse output,

the number of said flip-flops of said input register being equal to the number of binary indications in said code of the first operand,

said flip-flops of said input register being divided into groups;

an interrogation register to receive and store the interrogation code in the form of a given set of binary indications made up of

flip-flops with direct and inverse inputs, and direct and inverse outputs,

the number of said flip-flops of said interrogation register being equal to the number of said flip-flops of said input register,

said flip-flops of said interrogation register being divided into groups equal in number to said groups of said flip-flops of said input register;

coincidence circuits which have first and second inputs and outputs,

said coincidence circuits being arranged in groups, two of said coincidence circuits being in each group,

the number of said coincidence circuits being equal to the number of said flip-flops of said input register,

said first inputs of first and second coincidence dircuits in each said group being connected, respectively, to said direct and inverse outputs of said respective flip-flops of said input register,

said outputs of said first and second coincidence circuits in each said group being connected, respectively, to said direct and inverse inputs of said respective flip-flop of said interrogation register;

interrogation decoders for converting said interrogation code which have inputs and outputs;

OR circuits which have first and second inputs and outputs,

said OR circuits being arranged in groups, two OR circuits being in each group,

the number of said OR circuits being equal to the number of said flip-flops of said input register,

said first inputs of first and second OR circuits of each said group being connected, respectively, to said direct and inverse outputs of said respective flip-flop of said interrogation register,

said outputs of said first and second OR circuits of each said group being connected to respective inputs of said interrogation decoders;

a mask register to receive and store the mask code in the form of a given set of binary indications, which show said indications of said interrogation code irrelevant to the search operation to be performed, with

flip-flops having inputs and direct outputs,

the number of said flip-flops of said mask register being equal to the number of said flip-flops of said input register,

said flip-flops of said mask register making up ring shift registers in a number equal to said groups of said flip-flops in said input register,

said direct outputs of said flip-flops of said mask register being connected to said second inputs of said OR circuits of said respective group;

an operation decoder to control information transfer from said outputs of said flip-flops in said input register to said inputs of said respective flip-flops in said interrogation register in a direct code and inverse code, depending on the logical operation to be performed, having inputs and outputs,

first and second outputs of said operation decoder being connected to said second inputs of, respectively, said first and second coincidence circuit in each said group of said coincidence circuits; and

a data storage unit to perform arithmetic and parallel logical operations on attributive information having interrogation buses and control inputs,

said interrogation buses of said data storage unit being connected to said outputs of said respective interrogation decoders,

said control inputs of said data storage unit being connected to respective outputs of said operation decoder.

4,069,474

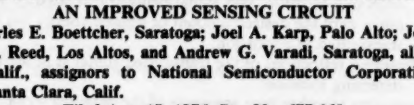
MOS DYNAMIC RANDOM ACCESS MEMORY HAVING AN IMPROVED SENSING CIRCUIT

Charles E. Boettcher, Saratoga; Joel A. Karp, Palo Alto; John A. Reed, Los Altos, and Andrew G. Varadi, Saratoga, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 15, 1976, Ser. No. 677,462

Int. Cl.[2] G11C *7/06, 11/24, 11/40*

U.S. Cl. 365—205 **5 Claims**



1. In a memory circuit:

bit line means having first and second portions over which electrical potentials representative of data to be stored in the memory are sensed and restored;

memory cell means for storing the electrical potentials representative of data to be read out therefrom and restored thereto in use;

switch means for electrically coupling the electrical poten-

tials, representative of the stored and restored data, between said bit line means and said memory cell means in response to address signals applied to said switch means;

sense amplifier means coupled between first and second portions of said bit line means for sensing the difference in electrical potential therebetween generated in response to electrical potential read from one of said addressed memory cell means onto one of said first and second portions of said bit line means; and

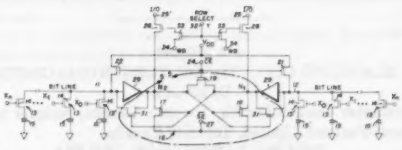
buffer line amplifier means coupled between said sense amplifier means and said bit line means for isolating capacitance of said sense amplifier means from said bit lines means wherein said buffer line amplifier means includes, transistor means having a gate terminal and first and second other terminals, said gate terminal being connected to one of said bit line portions, and said other first and second terminals being connected for source follower amplifier operation relative to input signals received from said bit line means.

4,069,475

MOS DYNAMIC RANDOM ACCESS MEMORY HAVING AN IMPROVED SENSE AND RESTORE CIRCUIT

Charles E. Boettcher, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 15, 1976, Ser. No. 677,463
Int. Cl.² G11C *7/06, 11/24, 11/40*
U.S. Cl. 365—205 **4 Claims**



1. In a memory circuit:

bit line means having first and second portions over which electrical potentials representative of data to be stored in the memory are sensed and restored;

memory cell means for storing the electrical potentials representative of data to be read therefrom and restored thereto in use;

switch means for electrically coupling the electrical potentials, representative of the stored and restored data, between said bit line means and said memory cell means in response to address signals applied to said switch means;

sense amplifier means coupled between said first and second portions of said bit line means for sensing the difference in electrical potential therebetween generated in response to the electrical potential read from one of said addressed memory cell means onto one of said first and second portions of said bit line means;

buffer line amplifier means coupled between said sense ammplifier means and said bit line means for isolating the capacitance of said sense amplifier means from said bit line means;

restore circuit means interconnecting said sense amplifier and a first one of said portions of said bit line means and being disposed in bypassing relation to a first one of said buffer line amplifier means for selectively bypassing electrical signals from said sense amplifier means back around said first buffer line amplifier means to said first portion of said bit line means for restoring an electrical potential read out of one of said addressed memory cells, said restore circuit means including first restore switch means responsive to a restore timing signal for selectively rendering said first switch means conductive for bypassing said first buffer line amplifier means through said first restore circuit means; and

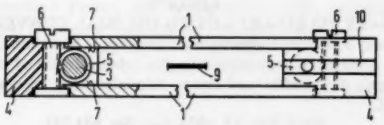
means for deriving said restore timing signal from an electrical state of said sense amplifier means.

4,069,476

ARRANGEMENT FOR PRODUCING A CONSTANT MAGNETIC FIELD

Franz Navratil, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 17, 1976, Ser. No. 667,530
Claims priority, application Germany, Mar. 26, 1975, 2513441
Int. Cl.² G11C *19/08*
U.S. Cl. 365—6 **2 Claims**



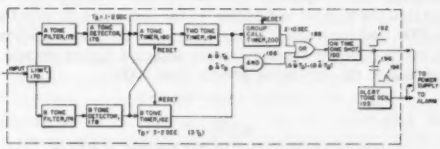
1. An arrangement for generating a constant magnetic supporting field for a magnetic cylindrical domain store, comprising a magnetic matrix of at least two magnetic plates having soft magnetic properties arranged plane-parallel to each other and separated by an interval gap, and two bar-shaped permanent magnets located within said interval gap between said plates and arranged concurrently and substantially apart, said permanent magnets having their longitudinal middle axes parallel to each other and magnetized perpendicularly thereto, at least one of said permanent magnets rotatable about its longitudinal axis, a store carrier for holding said domain store in said supporting field, and a U-shaped carrier comprising a means for mounting and aligning said soft magnetic plates and having magnetically non-conducting properties of only low thermal expansion, wherein each of said bar-shaped permanent magnets is rotatably mounted between the legs of said U-shaped carrier.

4,069,477

TONE ADDRESS DECODER FOR PAGER

James W. Maben, Brookline, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed May 22, 1975, Ser. No. 580,091
Int. Cl.² H04B *1/04*
U.S. Cl. 340—311 **7 Claims**



1. In a paging unit including means for receiving predetermined sequential tone address signals followed by message signals and for actuating the remainder of the pager circuitry to present the message to the recipient in response to receipt of a decoded tone address sequence, the improvement in the address decoding circuitry comprising:

tuned reed actuated tone detectors each generating a signal upon the presence of a predetermined tone;

a first normally-off timing circuit actuated in response to the generation of a signal due to the detection of a first predetermined tone by an associated tone detector;

a second normally-off timing circuit actuated in response to the generation of a signal due to the detection of a second predetermined tone by an associated tone detector;

means for extending the duration of the output of the timing circuit associated with said first predetermined tone to

overlap the output from the timing circuit associated with said second predetermined tone;

means for actuating the remainder of the pager circuitry in the simultaneous presence of the outputs from the timing circuits and,

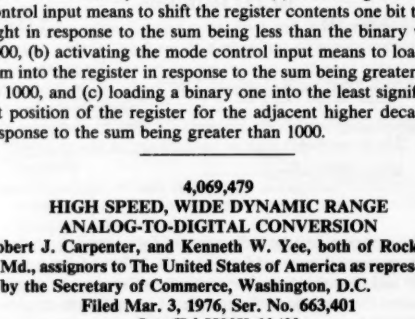
cross inhibiting shock protection means for inhibiting the output of one timing circuit only in the presence of a tone to which the other timing circuit responds such that said address decoding circuitry responds only to AB followed immediately by BA, where A and B designate different tones and A and B designate the absence of the respective tone.

4,069,478

BINARY TO BINARY CODED DECIMAL CONVERTER

Anthony J. Miller, Bethesda, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 12, 1975, Ser. No. 631,341
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD **7 Claims**



1. Apparatus for converting a binary coded input signal to a binary coded decimal output signal having N decades comprisng N shift registers each having four bit positions, means for sequentially supplying the bits of the input signal to the least significant bit position of the register for the units decade of the binary coded decimal signal, the bits of the input signal being supplied in order to the least significant bit position of the units decade register with the most significant bit of the input signal being applied first, each of said registers having a right shift-parallel load most control input means, and means responsive to the sum of the value stored in each of said registers and the binary value 0011 for: (a) activating the mode control input means to shift the register contents one bit to the right in response to the sum being less than the binary value 1000, (b) activating the mode control input means to load the sum into the register in response to the sum being greater than to 1000, and (c) loading a binary one into the least significant bit position of the register for the adjacent higher decade in response to the sum being greater than 1000.

4,069,479

HIGH SPEED, WIDE DYNAMIC RANGE ANALOG-TO-DIGITAL CONVERSION

Robert J. Carpenter, and Kenneth W. Yee, both of Rockville, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Mar. 3, 1976, Ser. No. 663,401
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD **6 Claims**

1. An expanded dynamic range analog-to-digital conversion system having a plurality of output ranges of Y-bit resolution comprising,

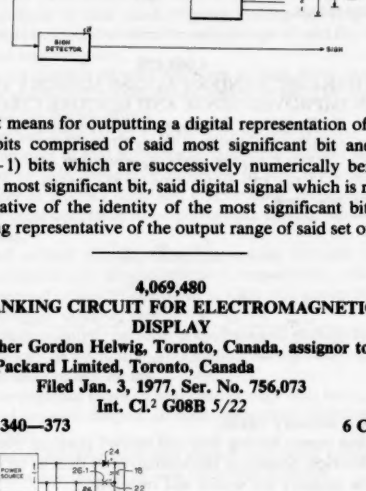
an input for receiving an analog input signal,

a plurality of separate analog-to-digital converters of X-bit resolution, X being a number greater than Y,

a unit gain signal path between said input and one of said analog-to-digital converters,

amplification means between said input and another of said analog-to-digital converters, said other of said converters corresponding to lower output ranges than said one of said converters,

means for determining the most significant output bit of said converters and for generating a digital signal representative of the identity of said most significant bit, and



output means for outputting a digital representation of a set of bits comprised of said most significant bit and the (Y−1) bits which are successively numerically beneath said most significant bit, said digital signal which is representative of the identity of the most significant bit also being representative of the output range of said set of bits.

4,069,480

BLANKING CIRCUIT FOR ELECTROMAGNETIC DISPLAY

Christopher Gordon Helwig, Toronto, Canada, assignor to Ferranti-Packard Limited, Toronto, Canada

Filed Jan. 3, 1977, Ser. No. 756,073
Int. Cl.[2] G08B *5/22*
U.S. Cl. 340—373 **6 Claims**

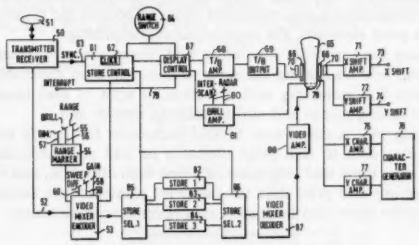
1. In an electromagnetically operated display comprising groups of rotatably mounted elements having opposed faces of contrasting colors and each carrying a magnet rotatable therewith; the operation of each said element and the choice of contrasting color displayed thereby, being determined by the magnetic field formed by an adjacent reversibly permanently magnetizable field forming member, a winding corresponding to each field forming member located so that a pulse through said winding in a predetermined sense will magnetize said field forming member in a corresponding sense,

wherein groups of said elements are arranged in rows and columns,
one end of each winding corresponding to elements in the same column in such group being connected to a column lead,
the other end of each winding corresponding to elements in the same row in such group being connected both to a positive row lead by a rectifying means poled to conduct from said positive lead toward said winding and to a negative row lead by a rectifying means poled to conduct from said winding toward said negative lead,
whereby an element may be caused to display a selected one of its contrasting faces by application of a pulse in the proper sense across one of the row leads corresponding to the element and the column lead corresponding to the element,
the windings of elements connected to the same row leads being wound in one sense,
the windings of elements connected to some pairs of row leads being wound in the opposite sense to windings connected to other pairs of row leads,
a capacitor,
a connection to one side of said capacitor connected to each of the positive row leads of the group corresponding to elements with windings in one sense, through a rectifier poled to conduct in the direction from the condenser toward the respective row lead,
a connection to the other side of said capacitor connected to each of the negative row leads with windings in the other sense, through a rectifier poled to conduct in the direction from the respective negative row lead toward the condenser,
means for selectively connecting and disconnecting one of said connections to said capacitor,
means for charging said capacitor.

4,069,481
PULSE RADAR APPARATUS

Maurice Henry Easy, Maidenhead; Harry Donald Cramp; Peter Lambert Hartley, both of New Malden, and Philip David Lane Williams, Banstead, all of England, assignors to Decca Ltd., London, England

Filed Apr. 30, 1975, Ser. No. 573,090
Claims priority, application United Kingdom, May 1, 1974, 19160/74
Int. Cl.[2] G01S *7/06, 7/22*
U.S. Cl. 343—6 TV **12 Claims**

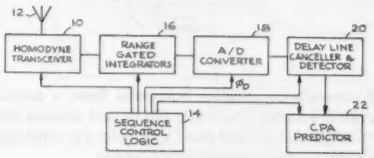


1. Pulse radar apparatus having a receiver for receiving and rectifying incoming radar video signals, wherein there are provided a cathode-ray display tube, a single speed time-base generator providing a time base trace on the screen of the cathode-ray tube, means for scanning the time base trace across the screen of the tube, clock-controlled means for repetitively samplying at a first clock rate and quantizing the amplitude of the received and rectified signals in successive periods between radar pulses, storage means for storing quantized signals from successive ones of said radar pulse periods, clock-controlled means for reading the signals from said store at a second clock rate and applying them as a brightness modulation to said time base, range selector means adapted for selectively adjusting said first clock rate of said sampling means to effect alteration of the relative clock rates, whereby to effect changes of displayed range on the cathode-ray tube screen, and means controlling said reading means to repeat reading the previously read signals from the store in synchronism with said single speed time base generator to provide repeated substantially identical scans on the cathode-ray tube screen until the beginning of the next radar pulse period.

4,069,482
TARGET RANGE SENSOR

Clarence B. Parker, Pomona; Peter M. McCray, Claremont, and L. Lamoyne Taylor, Alta Loma, all of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed July 15, 1976, Ser. No. 705,501
Int. Cl.[2] G01S *9/42, 9/06*
U.S. Cl. 343—7.7 **14 Claims**



1. A radar system comprising:
a homodyne transceiver including means for directing received radio frequency signals in gated sections to range gated integrating means;
range gated integrating means connected to receive said directed radio frequency signals for integrating the signals over the time period of a gated section, and including means for directing the integrated signal result to analog-to-digital converting means upon actuation by a control pulse;
analog-to-digital converting means for converting the integrated signal result to a digital, pulsed component form upon actuation by a control pulse;
delay line canceller and detector means for removing relatively low frequency, integrated signal digital components and for passing relatively higher frequency, integrated signal digital components to a delay line canceller and detector means output;
digital component processor means coupled to said output for receiving over a period of time the passed relatively higher frequency, integrated signal digital components from the delay line canceller and detector means output and for computing from said received components a predicted position closest to said homodyne transceiver which a selected target object will traverse; and
digital bit pulse control logic means for generating and selectively sending to the homodyne transceiver means, to the range gated integrating means, and to the analog-to-digital converting means control pulses for actuating each respective means in predetermined sequential order.

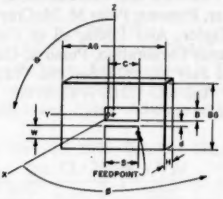
4,069,483
COUPLED FED MAGNETIC MICROSTRIP DIPOLE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,691
Int. Cl.[2] H01Q *00/00, 1/48*
U.S. Cl. 343—700 MS **9 Claims**

1. A coupled fed magnetic microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:
a. a thin ground plane conductor;

b. a thin rectangular microstrip radiating element and a separate thin rectangular-shaped microstrip nonradiating coupler alongside and spaced apart from said radiating element;
c. said radiating element and non-radiating coupler being parallel to each other in the same plane and equally spaced from said ground plane;
d. said radiating element and nonradiating coupler being electrically separated from said ground plane by a dielectric substrate;
e. said radiating element being shorted to the ground plane at one end of the length thereof;



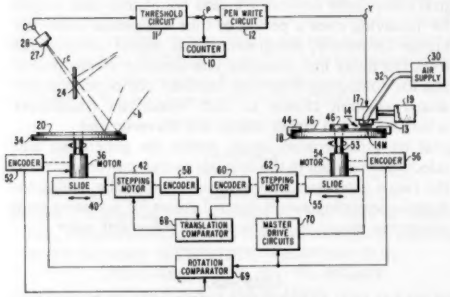
f. said nonradiating coupler being fed from a coaxial-to-microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to a feed point on said nonradiating coupler;
g. the length of said radiating element determining the resonant frequency of said antenna;
h. the antenna input impedance being variable to match most practical impedances by varying any of the coupler length and the distance between said radiating element and said nonradiating coupler without affecting the radiation pattern of the antenna.

4,069,484

DEFECT PLOTTING SYSTEM

Arthur Herbert Firester, Skillman, and Joseph Paul Walentine, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 28, 1976, Ser. No. 691,204
Int. Cl.[2] G01D *5/39*
U.S. Cl. 346—33 F **5 Claims**



1. A defect plotting system for recording on electrosensitive paper a plot of the locations of significant defects appearing in the groove structure of a spirally grooved disc record; said plotting system comprising:

A. defect detecting means for developing defect data in response to a probing of the grooved surface of said disc record in spiral scanning pattern; and

B. defect plotting means comprising:

1. a turntable having a flat metallic surface upon which said electrosensitive paper is placed;

2. electric pen writing means, including a stylus subject to contact with said electrosensitive paper, for inscribing marks on said electrosensitive paper when actuated;

3. means for establishing relative motion between said turntable and said writing means in a manner causing said stylus to traverse said electrosensitive paper along a spiral path in synchronism with the probing of the grooved surface of said disc record;

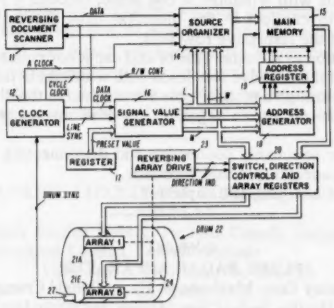
4. means, responsive to said defect data, for generating an electrical writing pulse signal indicative of the reception of significant defect data; and an actuating circuit for said electric pen writing means, electrically coupled between said stylus and said turntable surface, and responsive to said writing pulse signal generation.

4,069,485

BIDIRECTIONAL INK JET PRINTER WITH MOVING RECORD RECEIVER

Van Clifton Martin, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 22, 1976, Ser. No. 744,223
Int. Cl.[2] G01D *15/18*; B41J *1/00*
U.S. Cl. 346—75 **12 Claims**



1. In a multiple print element copying apparatus with image scanning means for scanning an original, means for simultaneously translating a receiving medium with respect to the multiple print elements in a first repeating direction and in a second scan direction substantially orthogonal to the first direction to interlace the paths traced by the print elements, and means for supplying data from the scanning means to the print elements in a predetermined order to control the printing of the print elements, the improvement comprising:

means for reversibly operating said image scanning means and said translating means in said second scan direction;

means for indicating said direction of scan of said image scanning means and said translating means; and

gating means responsive to said indication for gating said print data to said print elements in said predetermined order upon said indication of a first scan direction, and for gating said print data to said print elements in a second order upon said indication of a reverse scan direction.

4,069,486

SINGLE ARRAY INK JET PRINTER

Sidney Jared Fox, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,423
Int. Cl.[2] G01D *15/18*; B41J *1/00*
U.S. Cl. 346—75 **6 Claims**

1. An interlaced multiple element printer mechanism suitable for use in a copier or the like comprising:

a member for supporting a media suitable for receiving indicia on at least one surface thereof;

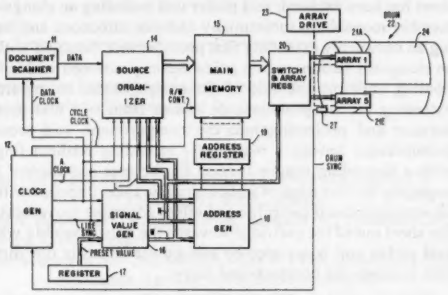
a support mounted adjacent said at least one surface of said media support member and arranged for relative move-

ment in two substantially orthogonal directions with respect to said media support member;

a plurality of selectively operable marking means mounted on the said support and arranged in a substantially straight line parallel to one of the directions of relative movement between the media support member and the adjacent support, and

selectively operable marking means being spaced from each other by a distance equal to (k) resolution elements where a resolution element is equal to the distance between sucessive marks formed on the media in a direction parallel to the line of marking means when all of the marking elements are operable and k is an integer which then divided by (N), the total number of selectively operable means, results in an irreducible fraction; and

means for simultaneously causing relative movement in the said two substantially orthogonal directions so that the marking means advance with respect to the media support in a direction parallel to the line of the marking means N resolution elements while the line of marking means move across the media in the said other direction in its entirety one time.



4,069,487

RECORDING MEMBER AND PROCESS FOR RECORDING

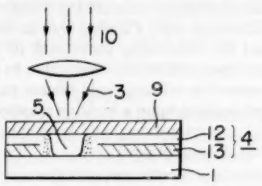
Masanao Kasai, Tokyo; Youko Oikawa, Kawasaki; Hiroshi Ito, Yokohama, and Hiroshi Matsuno, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1975, Ser. No. 643,171

Claims priority, application Japan, Dec. 26, 1974, 50-2459; Jan. 29, 1975, 50-12072; May 19, 1975, 50-59370

Int. Cl.[2] G01G *15/34*

U.S. Cl. 346—76 L **4 Claims**



1. A recording member for recording by applying a laser beam to remove a part of a recording layer by melting and/or vaporization which comprises a support, a recording layer overlying the support, and a protecting layer overlying the recording layer, said recording layer being composed of a laminate including a sulphur compound layer and a metal layer and being about 0.01 - 1 micron in thickness, the metal layer underlying the sulphur compound layer in the direction of application of the laser beam, and said protecting layer being not substantially destroyed by the application of the laser beam for recording.

4,069,488

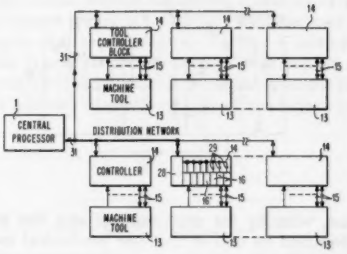
COMPUTER CONTROLLED DISTRIBUTION APPARATUS FOR DISTRIBUTING TRANSACTIONS TO AND FROM CONTROLLED MACHINES TOOLS

Robert M. Fiorenza, Shelbourne, Vt.; Alan J. Fleming, Poughquag, N.Y.; Ralph J. Gerlach, Austin, Tex.; Larry W. Holmstrom, Boca Raton, Fla., and John C. Pace, Wappingers Falls, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,011

Int. Cl.[2] G06F *15/46*

U.S. Cl. 364—474 **22 Claims**



1. A system for controlling a plurality of machine tools comprising

a central processor,

a plurality of tool controllers each operatively associated with a machine tool,

each of said controllers comprising at least one tool control unit, adapted to provide a data output to the associated machine tool for controlling a tool function and/or for receiving from said tool, a data input indicative of a tool condition,

a main multiple channel data bus connected to said central processor for conducting data transactions by transferring parallel bits of digital data to and from the processor,

a plurality of multiple channel unit data buses,

each of said buses being connected to one of said tool control units,

data distribution means coupling said unit data buses to said main data bus comprising

means responsive to a set of distribution signals from said central processor for selectively activating one of said tool control units and for selectively activating only the data path from said main bus through the unit data bus connected to said selected control unit, and

means for maintaining only said activated data path open through said main data bus to said central processor and maintaining all other data paths through unit data buses to unselected tool control units closed until the central processor issues the next set of distribution signals for selectively activating another tool control unit.

4,069,489

AUTOMATIC EXPOSURE CONTROL DEVICES USING BI-DIRECTIONAL TRANSISTORS

Motonobu Matsuda, Izumi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1976, Ser. No. 676,638

Claims priority, application Japan, Apr. 18, 1975, 50-48047; June 12, 1975, 50-80281[U]

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—51 **12 Claims**

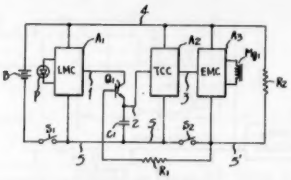
1. An automatic exposure control circuit for a photographic camera including a light measuring circuit for generating an

output signal representative of scene brightness, a storage capacitor for storing the output signal, and an electric timing circuit for controlling exposure time through exposure terminating means in accordance with the stored output signal, comprising:

at least one mechanical switch operated in association with the camera shutter releasing operation;

a bi-directional bi-polar transistor including a collector and emitter connected between said light measuring circuit and said storage capacitor, said bi-directional transistor further including a base and having the capability of conducting current from the collector to the emitter thereof and vice versa when bias potential is applied to said base;

a biasing circuit for generating said bias potential and connected to said at least one mechanical switch and said



base, whereby the application of said bias potential is controlled by said at least one mechanical switch, said biasing circuit includes semiconductor switching means for controlling the application of bias potential to the base of said bi-directional transistor, said semiconductor switching means being controlled by said at least one mechanical switch; and

a power source and a pair of power busses respectively connected to each terminal of said power source, and said biasing circuit further includes a bias resistor serially connected with the emitter-collector of said semiconductor switching means between said pair of power busses, and said base of said bi-directional transistor being connected to the junction of said bias resistor and the collector of said semiconductor switching means.

4,069,490

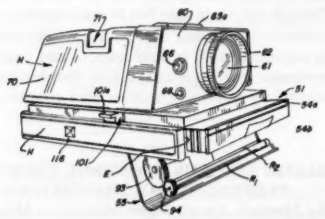
CAMERA CONSTRUCTION

Thomas G. Graham, Point Pleasant Beach; John Maltese, Saddle Brook, both of N.J.; Israel Nesson, Brighton, Mass., and Robert Mitchell, Pequannock, N.J., assignors to Berkey Photo, Inc., Clifton, N.J.

Division of Ser. No. 558,933, March 17, 1975, Pat. No. 3,983,570. This application Apr. 12, 1976, Ser. No. 675,815

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—83 **18 Claims**



1. A camera construction comprising a housing with a compartment therein provided with an entry for removably accommodating a cartridge containing a plurality of photographic sheets arranged in superposed relation and with a corresponding surface of each sheet being light sensitive; drive means within the housing for selectively removing a sheet from the cartridge subsequent to the light sensitive surface thereof being exposed; and a door assembly mounted on the housing for movement between open and closed positions with respect to the compartment entry; said drive means having a picker unit mounted within said compartment for reciprocatory movement towards and away from the compartment entry to effect removal of an exposed photographic sheet from an accommodated cartridge, and power means for controlled actuation of said picker unit; said power means being capable of operation when a cartridge is accommodated in the housing, the door assembly is in a closed position and the photographic sheet has been exposed; said picker unit including an elongated member movable in substantially endwise directions and having an outwardly extending first protuberance disposed within an elongated stationary first guide means positioned within the housing adjacent one side of the compartment, an inwardly extending second protuberance spaced from said first protuberance and projecting into the compartment, said second protuberance having a rearwardly extending resilient finger with a depending tongue formed on the rear end thereof for engaging the rear edge of a photographic sheet disposed within an accommodated cartridge and effect edgewise movement of the sheet out of the cartridge towards the door assembly when said picker unit is actuated by said power means in one direction towards the compartment entry.

4,069,491

TIMING MECHANISM FOR PHOTOGRAPHIC SHUTTERS

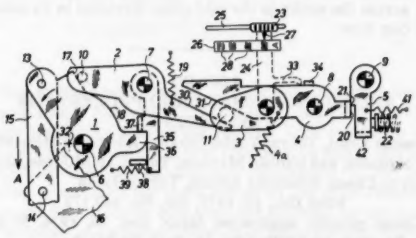
Erwin Scholz, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Feb. 11, 1977, Ser. No. 767,774

Claims priority, application Germany, Feb. 20, 1976, 2606864

Int. Cl.[2] G03B *9/62, 17/40*

U.S. Cl. 354—267 **12 Claims**



1. Timing mechanism for timing the release of a trailing shutter element with relation to release of a leading shutter element, said mechanism comprising a control member movable in synchronism with a leadng shutter element, a movable release pawl for restraining movement of a trailing shutter element, and lever mechanism responsive to movement of said control member for releasing said release pawl for movement to a released position upon a variable selected extent of movement of said control member, said lever mechanism having its own separate driving power.

4,069,492

ELECTROLUMINESCENT SEMICONDUCTOR DEVICE HAVING A BODY OF AMORPHOUS SILICON

Jacques Isaac Pankove, Princeton, N.J., and David Emil Carlson, Yardley, Pa., assignors to RCA Corporation, New York, N.Y.

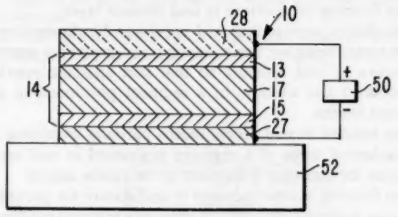
Filed Aug. 23, 1976, Ser. No. 716,532

Int. Cl.[2] H01L *33/00, 45/00*

U.S. Cl. 357—17 **14 Claims**

1. An electroluminescent semiconductor device comprising: a body of amorphous silicon fabricated by a glow discharge,

said body having a semiconductor junction either at the surface or in said body; and



means for forward biasing said body with a voltage so as to generate radiation in said body.

4,069,493

NOVEL INTEGRATED CIRCUIT AND METHOD OF MANUFACTURING SAME

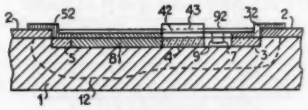
Albert Bobenrieth, Paris, France, assignor to Thomson-CSF, Paris Cedex, France

Continuation of Ser. No. 468,089, May 8, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,572

Claims priority, application France, Oct. 2, 1970, 70.35702

Int. Cl.[2] **H01L** *29/80, 29/48, 27/02, 29/78*

U.S. Cl. 357—22 **4 Claims**



1. A field effect transistor comprising:

a weakly doped semiconductive substrate of a first conductivity type having a substantially plane surface, and, in said substrate, contiguous to said surface;

a source and a drain region consisting of a first and a second ion implanted regions of a common depth, said common depth being on the order of one micron, said regions being highly doped by impurities of a second conductivity type opposite to said first type;

a channel region consisting of a third ion implanted region of a common depth as said first and second regions and filling the whole space between said regions, said third region being of said second conductivity type but less doped than said first and second regions;

a gate region consisting of a fourth ion implanted region, occupying a portion of said third region situated at equal distance of said first and second regions, said fourth region having a depth on the order of 0.5 micron.

4,069,494

INVERTER CIRCUIT ARRANGEMENTS

David Latham Grundy, Saddleworth, England, assignor to Ferranti Limited, Hollinwood, Lancashire, England

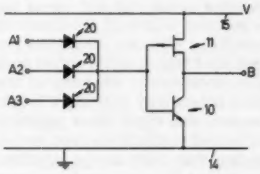
Division of Ser. No. 442,823, Feb. 15, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,403

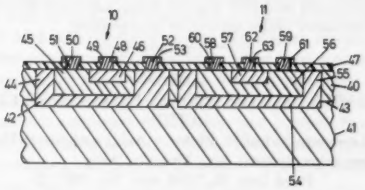
Claims priority, application United Kingdom, Feb. 17, 1973, 07910/73

Int. Cl.[2] **H01L** *27/04, 27/02*

U.S. Cl. 357—41 **12 Claims**

1. An inverter circuit arrangement within a monolithic semiconductor body comprising a shallow epitaxial layer of one conductivity type on a substrate of the same conductivity type, the arrangement including at least a pair of circuit elements spaced from each other within the semiconductor body, each circuit element including a defined region of the epitaxial layer, a buried layer of opposite conductivity type at the interface between the defined region of the epitaxial layer and the substrate, a heavily doped isolation barrier of opposite conductivity type, said isolation barrier extending through the epitaxial layer into contact with the buried layer, and the defined region including a surface portion remote from the substrate, said surface portion having a part which is of said opposite conductivity type, one of said pair of circuit elements comprising a bipolar transistor with a collector comprising the combination of the buried layer and the isolation barrier, a base including an unmodified part of the defined region of the epitaxial layer, an emitter comprising the part of said opposite conductivity type of the surface portion of the defined region, the emitter being surrounded by material of said one conductivity type within the semiconductor body, and the bipolar transistor having electrode connections to the collector, the base and the emitter, the other circuit element comprising a field-effect transistor with a channel region including an unmodified part of the defined region of the epitaxial layer, the part of said opposite conductivity type of the surface portion of the defined region is contiguous with the isolation barrier, and bisects the remaining part of said one conductivity type of the surface portion



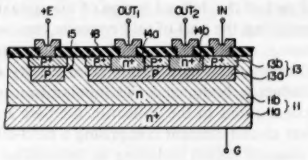


into two regions, the part of said opposite conductivity type comprising the gate of the field-effect transistor, the remaining two regions of the surface portion comprising the source and the drain, and the field-effect transistor having electrode connections to the gate, the source and the drain, there also being provided within the circuit arrangement electrical connections such that the base of the bipolar transistor and the gate of the field-effect transistor are connected in common to receive input signals to the circuit arrangement, the collector of the bipolar transistor and the source of the field-effect transistor are connected in common to provide the output for the circuit arrangement, the drain of the field-effect transistor is connected to a point to be maintained at a first reference potential level, and the emitter of the bipolar transistor is connected to a point to be maintained at a second reference potential level, each input signal to the circuit arrangement to have two possible voltage levels, with one of the two possible input voltage levels causing the bipolar transistor to be switched ON and the field-effect transistor to be switched OFF, and the other of the two possible input voltage levels causing the bipolar transistor to be switched OFF and the field-effect transistor to be switched ON.

4,069,495
SEMICONDUCTOR DEVICE FOR INTEGRATED INJECTION LOGIC

Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1976, Ser. No. 729,772
Claims priority, application Japan, Oct. 13, 1975, 50-123136
Int. Cl.[2] H01L *27/02, 27/04*
U.S. Cl. 357—46 6 Claims

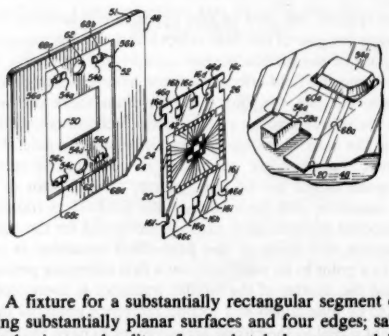


1. A semiconductor device for integrated injection logic comprising a semiconductor substrate of a first conductivity type, a signal input region of a second conductivity type provided in said semiconductor layer of said first conductivity type, at least one signal output region of said first conductivity type formed in said signal input region, a charge injection region of said second conductivity type of high impurity concentration provided closely to said signal input region and forming a pn junction with said semiconductor substrate of said first conductivity type, and electrodes provided for said substrate, signal input region, signal output regions and charge injection region, respectively, wheretby an inverted signal of an input signal is obtained by applying a forward bias voltage to said pn junction, said signal input region including a first portion of said second conductivity type having a lower impurity concentration than said charge injection region and a second portion having the same conductivity type as said first portion and having a higher impurity concentration than said first portion, said second portion being adjoined directly to said signal output region and connected to said signal input electrode, and said first portion being adjoined directly to at least the entire under surface of said portion.

4,069,496
REUSABLE FIXTURE FOR AN INTEGRATED CIRCUIT CHIP

John Lawrence Kowalski, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 30, 1976, Ser. No. 755,758
Int. Cl.[2] H01L *23/48, 23/02;* H02G *13/08;* H01R *13/50*
U.S. Cl. 357—70 13 Claims



1. A fixture for a substantially rectangular segment of film having substantially planar surfaces and four edges; said segment having a plurality of sprocket holes arranged in two parallel rows are substantially parallel to opposite edges of the segment, one sprocket hole of each row being a datum sprocket hole, and a pair of sprocket holes of each row being attachment sprocket holes; each segment having four attachment webs, each web forming an edge of an attachment sprocket hole and having a centroid; and means forming a window in said segment, said window having a position fixed relative to the datum sprocket holes; said fixture comprising:

a laminar layer;

means forming an aperture in said laminar layer,

recess means surrounding said aperture, the dimensions of the recess being such as to receive and position a segment relative to said aperture so that said aperture provides access to the window of a segment positioned in said recess means;

means located in said recess means partially overlying the attachment webs of a segment positioned in said recess means for retaining a segment in the recess means;

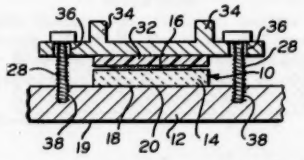
means forming access openings in said fixture for providing access to the datum sprocket holes of a segment positioned in said recess means; and

means forming detachment openings through said fixture for providing access to the centroids of the attachment webs of a segment positioned in said fixture.

4,069,497
HIGH HEAT DISSIPATION MOUNTING FOR SOLID STATE DEVICES AND CIRCUITS

Mark Steidlitz, Cherry Hill, N.J., assignor to EMC Technology, Inc., Cherry Hill, N.J.

Filed Aug. 13, 1975, Ser. No. 604,349
Int. Cl.[2] H01L *23/28, 23/42, 39/02, 23/02*
U.S. Cl. 357—80 14 Claims



1. An electronic assembly for enabling enhanced dissipation of heat from a heat generating portion of a solid state device, said assembly comprising said solid state device; a heat dissipation plate supplied externally to said solid state device; and means for mechanically clamping said solid state device to said externally supplied heat dissipation plate; said solid state device comprising an electrically insulating thermally conductive substrate and a current carrying film layer disposed directly on one surface of said substrate without the interposition of any thermal barrier therebetween, said current carrying film layer generating heat as a result of current flow therein; said mechanical clamping means mechanically clamping said solid state device to said externally supplied heat dissipation plate in direct thermally conductive bearing relationship between the thermally conductive substrate surface which is opposite to said one surface and said externally supplied heat dissipation plate for providing a direct thermally conductive heat dissipation path for heat generated in said current carrying layer to said thermally conductive substrate and therethrough to said externally supplied heat dissipation plate for thermal dissipation of said generated heat throughout said heat dissipation plate surface area.

4,069,498
STUDDED HEAT EXCHANGER FOR INTEGRATED CIRCUIT PACKAGE

Kailash Chandra Joshi, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

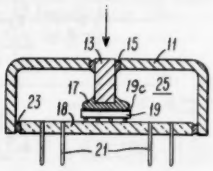
Filed Nov. 3, 1976, Ser. No. 738,783
Int. Cl.[2] H01L *23/02, 39/02*
U.S. Cl. 357—81 11 Claims

1. In and integrated circuit assembly including at least one integrated circuit device suitably mounted on a circuitized

substrate with a cap covering the device on the substrate, the improvement comprising:

an opening in said cap, said opening being positioned in said cap to be above said device when said cap covers said device;

a stud member having a high heat transfer coefficient adapted to be mounted in said opening proximate said device; and



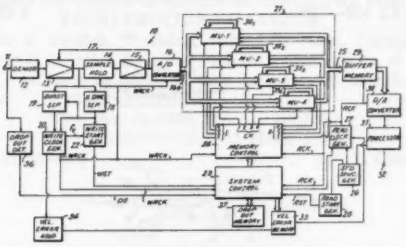
low melt solder in the periphery of said opening surrounding said stud and low melt solder on the tip of said stud proximate said device, whereby upon the application of heat to said assembly, said low melt solder melts and said stud is brought into an intimate heat transfer relationship with said device, and upon cooling the low melt solder solidifies to maintain an air tight enclosure with said cap over said substrate and electrical isolation between the solder on the tip of said stud and said device is established.

4,069,499

WRITE CLOCK PULSE SIGNAL GENERATOR FOR DIGITAL TIME BASE CORRECTOR

Takeshi Ninomiya, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 10, 1976, Ser. No. 694,827
Claims priority, application Japan, June 12, 1975, 50-71209
Int. Cl.² H04N 5/78
U.S. Cl. 358—8 **11 Claims**



1. In a time base corrector for periodic information signals containing first and second reference signals having relatively low and high frequencies, respectively varying with time base errors in such periodic information signals, and in which the following periodic information signals are converted to digital form and written in a memory at a clocking rate determined by a write clock pulse signal modulated in accordance with time base errors in the incoming signals, whereupon the digitized signals temporarily stored in the memory are read out therefrom substantially at a standard clocking rate and the resulting digitized output from the memory is reconverted to analog form for eliminating the time base errors: a generator for said write clock pulse signal comprising an automatic frequency control circuit including a variable frequency oscillator having an output with a center frequency which is a multiple of said high frequency of the second reference signal, and phase locked loop means receiving said oscillator output and said first reference signal for varying the frequency of said oscillator output in accordance with variations in the frequency of said first reference signal; and

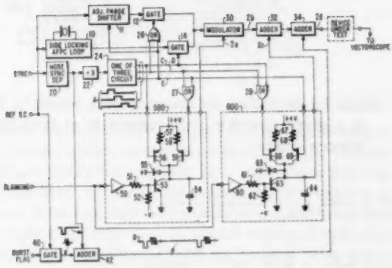
an automatic phase control circuit including variable phase shifting means, means for applying said oscillator output to said variable phase shifting means so as to obtain said write clock pulse signal at the output of said variable phase shifting means, and control means for said variable phase shifting means operative to vary the phase of said write clock pulse signal in dependence on a phase comparison of said second reference signal and said oscillator output.

4,069,500

ARRANGEMENTS FOR TESTING COLOR TELEVISION SYSTEMS

Robert Norman Hurst, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 737,004
Int. Cl.² H04N 9/62
U.S. Cl. 358—10 **2 Claims**



1. A method of testing color television systems in conjunction with a vectorscope display device for measuring saturation, hue and luminance crosstalk, comprising:

generating a repetitive cyclic test signal corresponding to first, second and third television lines having synchronizing and active line portions for developing first, second and third information traces on said display device;

said first television line active line portion having a constant chrominance amplitude with changing phase for representing variations in hue on said first information trace;

said second television line active line portion having a changing chrominance amplitude with constant phase for representing variations in saturation on said second information trace;

said third television line active line portion having a changing chrominance amplitude with constant phase and increasing luminance amplitude for representing variations in saturation with luminance on said third information trace;

applying said repetitive test signal to television equipment under test; and

measuring crosstalk in the form of hue into saturation, saturation into hue, saturation and luminance into hue as a function of the distortion of said first, second and third information traces.

4,069,501

SOLID-STATE VIDEO CAMERA

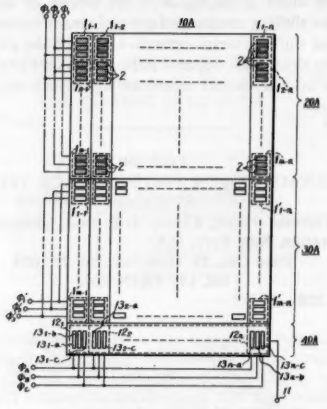
Seisuke Yamanaka, Mitaka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 11, 1976, Ser. No. 685,362
Claims priority, application Japan, May 13, 1975, 50-56912
Int. Cl.² H04N 9/04
U.S. Cl. 358—44 **5 Claims**

1. A solid state camera comprising:

a plurality of image sensors, each having a plurality of picture-sensing units spaced apart by an alignment pitch of τ_H,

means for displaying an image simultaneously on each of said image sensors,



means for displacing the image on each sensor by τ_{12} and τ_{13} in a given direction with respect to at least one of said sensors where

$$\tau^{12} = \frac{\tau H}{2\tau} \cos^{-1}\left(\frac{L_3^2 - L_1^2 - L_2^2}{2L_1L_2}\right)$$

$$\tau_{13} = \frac{\tau H}{2} + \frac{\tau H}{2\tau} \cos^{-1}\left(\frac{L_3^2 + L_1^2 - L_2^2}{2L_1L_3}\right)$$

where

τ_{12} is a displaced distance between the images projected on said first sensor and on said second sensor in said given direction,

τ_{13} is a displaced distance between the images projected on said first sensor and on said third sensor in said given direction, and

L_1, L_2 and L_3 are output signals levels from said first, second and third sensors,

means coupled to said picture sensing units for reading said respective images sequentially in said given direction,

means associated with said reading means for shifting the readout time thereof by a phase of the read-out frequency which corresponds to said displaced distances τ_{12} and τ_{13},

means coupled to said reading means for mixing the respective output signals thereof, and

means for deriving an output from said mixing means.

4,069,502

METHODS OF OPERATING PYROELECTRIC CAMERA TUBES

Peter David Nelson, Chelmsford, and Peter Baldwin Banks, Wickford, both of England, assignors to English Electric Valve Company Limited, England

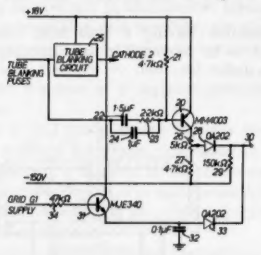
Filed June 14, 1976, Ser. No. 696,035

Claims priority, application United Kingdom, June 28, 1975, 27425/75

Int. Cl.² H04N *5/33*

U.S. Cl. 358—113 **7 Claims**

1. A circuit arrangement including a pyroelectric camera tube having an electron beam emitting cathode, a control grid G_1 controlling the electron beam and a gas in the interior space of the tube for producing a pedestal potential and pulse generator means for producing a positively-going pulse to the grid



G_1 during each period of line blanking whereby an increased pedestal potential is produced.

4,069,503

APPARATUS FOR RECORDING AND REPRODUCING SIGNALS USING A DISC-LIKE RECORDING MEDIUM

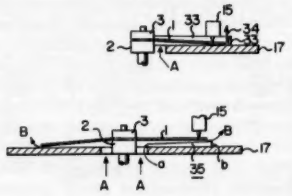
Tadashi Nagaoka, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 316,489, Dec. 19, 1972, abandoned. This application Nov. 5, 1974, Ser. No. 521,153

Claims priority, application Japan, Dec. 20, 1971, 46-105003; Dec. 28, 1971, 47-127; Dec. 29, 1971, 47-275; Dec. 29, 1971, 47-280

Int. Cl.² H04N *5/76;* **G11B** *15/38, 3/20*

U.S. Cl. 358—128 **6 Claims**



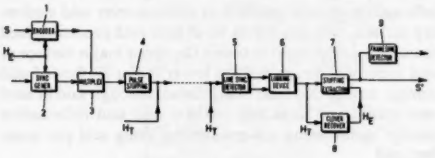
1. An apparatus for recording and reproducing signals, comprising a disc-like recording medium made of flexible material, a base plate, a turntable having an engaging portion which protrudes from the surface of the base plate and engages with the central portion of said recording medium to support said recording medium, driving means coupled to said turntable for rotating said turntable at high speed, an air inlet port formed in said base plate and located in the position corresponding to the central portion of said recording medium supported by said turntable, a pickup device which moves in a radial direction of and makes contact with said recording medium, and a convexity provided on said base plate and located between said recording medium and said base plate, said convexity being located under the radial moving path of said pickup device and extending from near the outer periphery of said recording medium towards the center of rotation of said recording medium, the height of said convexity from the base plate getting gradually smaller towards the center of rotation of said recording medium.

4,069,504

DIGITAL TRANSMISSION METHOD FOR CODED VIDEO SIGNALS

Jean-Claude Jolivet, Saint-Michel-en-Greve, and Francois-Xavier Antoine Stouls, Perros Guirec, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed June 23, 1976, Ser. No. 698,834
Claims priority, application France, July 3, 1975, 75 20865
Int. Cl.[2] H04N *7/04, 7/08*
U.S. Cl. 358—142 1 Claim



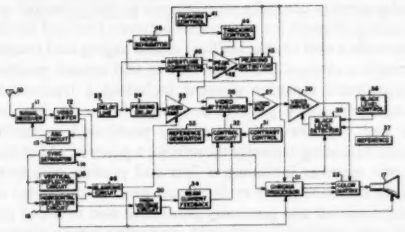
1. A method for the digital transmission of coded video signals with a fixed number of binary digits per frame dot, wherein each line of the video signal comprises a line synchronization word multiplexed during the line fly-back period, comprising using as line synchronization-word a pseudorandom sequence the self-correlation function of which is such that the synchronization word can be detected at the receiving equipment within a window of at least 3 binary digits, and stuffing each line of the video signal by eventually adding or substracting one binary digit during the line fly-back period at a fixed location in relation to the line synchronizing word.

4,069,505

AUTOMATIC PEAKING CONTROL CIRCUITRY FOR A VIDEO PROCESSING SYSTEM

Kenneth J. Burdick, Wyoming; Wilfred L. Hand, Clarence; Robert C. Wheeler, Elba, and Paul G. Wolfe, Batavia, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 19, 1977, Ser. No. 760,366
Int. Cl.[2] H04N *5/14, 5/52;* H03K *1/00*
U.S. Cl. 358—162 12 Claims



1. Automatic peaking control circuitry for a video processing system having an aperture correction stage for generating pre-shoot and over-shoot signals comprising:

bias means for providing an adjustable gain control signal to said aperture correction stage;

detecting means connected to said aperture correction stage for detecting the amplitude of said pre-shoot and over-shoot signals in excess of a predetermined threshold; and

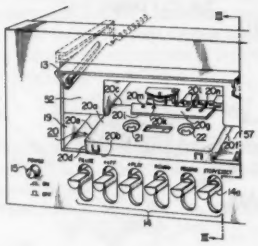
gain control means connected to said detecting means and to said bias means for automatically controlling the gain of said aperture correction stage to track said adjustable gain control signal.

4,069,506

CASSETTE INSERTION/EJECTION APPARATUS

Hideto Ueno, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed May 28, 1976, Ser. No. 691,087
Claims priority, application Japan, May 30, 1975, 50-72160[U]; May 30, 1975, 50-72161[U]; May 30, 1975, 50-72163[U]
Int. Cl.[2] G11B *15/10, 15/24, 23/04*
U.S. Cl. 360—96 11 Claims



1. A cassette insertion/ejection apparatus for positioning a cassette at a proper operation position and ejecting the cassette from the proper operation position, said apparatus using the cassette in the form of a housing comprising a top face, a bottom face, a front side face, a rear side face, a left-hand side face and a right-hand side face, in which a pair of hubs are rotatably supported between said top and bottom faces and a roll of tape wound about one of said hubs is extended near the openings capable of receiving magnetic heads in said front side face and wound about the other hub, and in which a pair of cassette locating holes are cut between said top and bottom faces, wherein said apparatus comprising:

a fixed member supporting a pair of turntables and cassette locating pins for rotatably supporting said pair of hubs;

a magnetic head means disposed on said front side of the cassette, said magnetic head means being away from the cassette and opposite to said openings when the cassette is disposed at said proper operational position;

a group of manipulating levers comprising an eject lever and disposed on said rear side;

a cassette tray means having two holes for penetrating the shafts of two turntables and mounted on a base member so as to swing up the magnetic head side thereof by a certain angle about an axis near said group of manipulation levers, at the swung up position said cassette tray being positioned above the top of said shafts of turntables to thereby situate said cassette carried on said cassette tray on the slope higher at the magnetic heads side than the group of munipulation side, at the non-swung up position, i.e. the proper operation position, said shafts of turntables penetrating through said holes and projecting above said cassette tray to be received in said hubs of said cassette, said cassette tray being transferred from said swung up position to said proper operation position in response to the insertion of said cassette and transferred from said proper operation position to said swung up position in response to the actuation of said eject lever;

a stabilizing means for holding said cassette to said fixed member under the situation of receiving said cassette locating pins mounted on said fixed member into said cassette locating holes when said cassette tray is brought into said proper operation position in response to the insertion of said cassette, said stabilizing means releasing said cassette in response to the actuation of said eject lever; and

a sliding down means for sliding down said cassette from said cassette tray by floating said cassette flow the slope of said cassette tray when said cassette tray is brought into

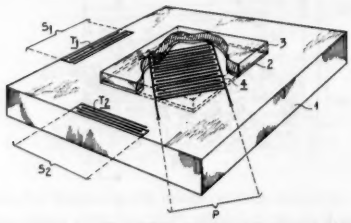
said swung up position in response to the actuation of said eject lever.

4,069,507

DEVICE FOR THE TWO-DIMENSIONAL READING OF OPTICAL IMAGES, USING ELASTIC SURFACE WAVES

Philippe Defranould, and Jean Desbois, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sept. 21, 1976, Ser. No. 725,242
Claims priority, application France, Sept. 26, 1975, 75 29607
Int. Cl.[2] H04N *5/30*
U.S. Cl. 358—213 **14 Claims**



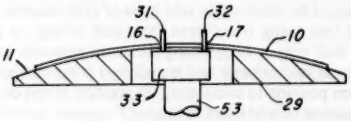
1. A device for the two-dimensional reading of an optical image using elastic surface waves, comprising a first piezoelectric medium at the surface of which elastic waves are capable of being propagated, and a second medium which is both semiconductive and photoconductive and in which the electrical fields associated with said elastic waves are capable of creating nonlinear interactions and where said image is projected, producing therein a spatial variation in conductivity, said first medium carring at least two electromechanical transducers which transmit elastic surface waves having the same frequency, in two separate directions of which the intersection defines a zone of interaction where said nonlinear interactions occur, the intensity of said interactions being modulated by said spatial variation in conductivity, said waves being transmitted respectively by said transducers with a period at least equal to the scanning time of the zone of interaction by an elastic wave and with variable relative delays, said device further comprising means for extracting the time independent signals produced by said nonlinear interaction, said extracting means having a spatial periodicity which corresponds to the one of said time independent signals.

4,069,508

FLEXIBLE MAGNETIC DISC RECORDING SYSTEM

Frank Thomas Bilek, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 25, 1976, Ser. No. 661,228
Int. Cl.[2] G11B *5/016, 5/76*
U.S. Cl. 360—99 **8 Claims**



1. A system for recording and/or reading information on a major surface of a sheet of flexible information storage media having upper and lower opposite major surfaces and at least one opening therethrough comprising:

a. a body having a stationary smoothing plane surface;

b. rotational means having an upper major surface located substantially in or below said smoothing plane surface for rotating said information storage media over said stationary surface with the lower major surface of said information storage media facing said stationary surface and the upper major surface of said rotational means, said rotational means having at least one pin member which mates with said at least one opening for coupling said information storage media to said rotational means, said at least one opening having a larger perimeter than said at least one pin member to the extent that said information storage media is freely laterally movable along said pin member wherein a fluid cushion of optimum thickness is substantially evenly formed between said stationary surface and the lower major surface of said storage media when said information storage media is in rotation over said stationary surface, and also forms, to at least said predetermined thickness, a fluid layer between the upper major surface of said rotational means and the lower major surface of said storage media, said fluid being drawn through said at least one opening to form said cushion and said information storage media being self-positioning along said pin member; and

c. a recording and/or reading head mounted in a predetermined position with respect to the stationary surface of said body for recording and/or reading said information on said information storage media when said media is in rotation.

4,069,509

THREE ELEMENT GAS TUBE PROTECTOR MODULE

Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corporation, Syosset, N.Y.

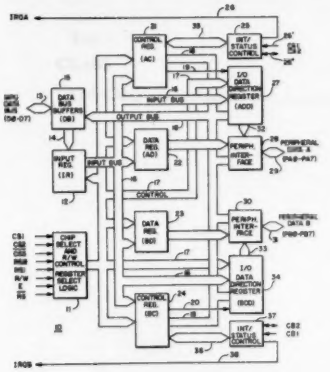
Filed Dec. 27, 1976, Ser. No. 754,545
Int. Cl.[2] H02H *7/20*
U.S. Cl. 361—124 **3 Claims**

1. An improved telephone line surge protecting device comprising: a casing element having a principal longitudinal axis including a plurality of oppositely disposed side walls defining a cavity; interconnected telephone input and output terminals having inner ends communicating with said cavity; a grounding prong element penetrating said casing element and communicating with said cavity; a temperature sensitive element mounted generally coaxially with respect to said principal axis of said casing element for movement between first and second positions within said cavity; resilient means urging said temperature sensitive element from said first to said second position; said temperature sensitive element including a transversely extending multisection gaseous discharge device having conductive end portions and a medially positioned grounding projection extending laterally therefrom; a generally U-shaped conductive member including a first end portion selectively contacting the conductive ends of said gaseous discharge device, and a second end generally parallel to said first end portion and communicating with said grounding prong element; said second portion mounting a hollow tube element surrounding said grounding projection on said gaseous discharge device and fixed thereto against the action of said resilient means by a meltable material; and a pair of resilient elongated electrically conducting contact members slidably contacting the conductive ends of said gaseous discharge device and the inner ends of said input and output terminals; whereby upon the melting of said meltable material said resilient means serves to move said gaseous discharge device into contact with said first end portion of said U-shaped member, resulting in current being conducted from said inner ends of said input and output terminals through the conductive ends of said gaseous discharge device to said U-shaped member and said grounding prong.

4,069,510
INTERRUPT STATUS REGISTER FOR INTERFACE ADAPTOR CHIP

Earl F. Carlow, Scottsdale, and Michael F. Wiles, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 519,143, Oct. 30, 1974, abandoned.
This application May 24, 1976, Ser. No. 689,212
Int. Cl.[2] G06F *3/04, 9/18*
U.S. Cl. 364—200 **6 Claims**



1. In an interface adaptor for interfacing between a peripheral data bus coupled to a peripheral device and to a system data bus coupled to processor means for executing a plurality of instructions, interrupt circuitry comprising:

an interrupt conductor for conducting an interrupt request signal from said peripheral device;

interrupt circuit means coupled to said interrupt conductor means for receiving said interrupt request signal and generating an interrupt request output signal in response to said interrupt request signal;

an interrupt output conductor coupled to said interrupt circuit means for conducting said interrupt request output signal;

first storage circuit means responsive to said interrupt circuit means and coupled between said interrupt circuit means and said system data bus for receiving and storing interrupt request status information representative of whether or not any interrupt request signal has been received by said interrupt circuit means;

a read conductor responsive to said processor means for conducting a read signal from said processor means to said interface adaptor;

address conductors responsive to said processor means for cnducting address signals representative of the location of said first storage circuit means form said processor means to said interface adaptor means;

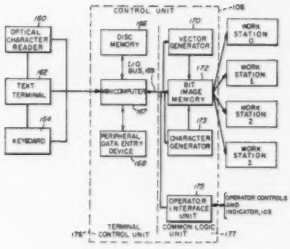
address decoding means responsive to said address conductors for decoding said address signals to produce a selection signal; and

means responsive to said selection signal and to said read signal and coupled to said first storage circuit means and to said system data bus for electrically coupling said first storage circuit means to said system data bus to effect reading said interrupt request status information by said processor means.

4,069,511
DIGITAL BIT IMAGE MEMORY SYSTEM

Helmut Lelke, Southboro, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed June 1, 1976, Ser. No. 691,686
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—200 **19 Claims**



1. A bit image memory for use with a visual display comprising in combination:

a semiconductor memory, said memory having at least one digital storage location for each elemental display position upon said visual display; and

means for reading out data from said memory to produce an image upon said visual display, said reading-out means being coupled to address inputs and data outputs of said memory, said memory being refreshed within the refresh time period of said visual display means.

DESIGN PATENTS

GRANTED JANUARY 17, 1978

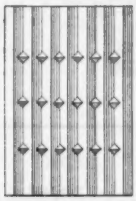
ERRATA

For CLASS	See PATENT NO.
D14–068	246,975

DESIGNS

JANUARY 17, 1978

246,941
TOASTER PRODUCT
Henry W. Kalt, 173 N. Mountain Ave., Montclair, N.J. 07042
Filed Mar. 8, 1976, Ser. No. 665,083
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—23

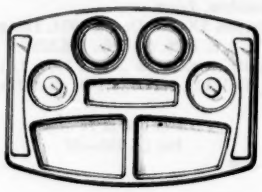


246,942
T-SHIRT
Cynthia Louise Popiela, 8304 Monroe Ave., Munster, Ind. 46321
Continuation-in-part of Ser. No. 499,149, Aug. 21, 1974, abandoned. This application Aug. 6, 1976, Ser. No. 712,173
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—215

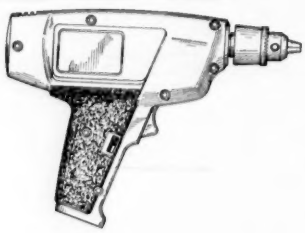
246,943
SHOE
Tatsuo Fukuoka, No. 3, 3-ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan
Division of Ser. No. 530,296, Dec. 6, 1974. This application Jan. 5, 1976, Ser. No. 646,528
Claims priority, application Japan, Nov. 1, 1974, 49-38440; Nov. 1, 1974, 49-38438; Nov. 8, 1974, 49-39273; Nov. 8, 1974, 49-39274
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—269

246,944
SHOE
Tatsuo Fukuoka, No. 3, 3-ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan
Division of Ser. No. 530,296, Dec. 6, 1974. This application Jan. 5, 1976, Ser. No. 646,529
Claims priority, application Japan, Nov. 1, 1974, 49-38440; Nov. 1, 1974, 49-38438; Nov. 8, 1974, 49-39273; Nov. 8, 1974, 49-39274
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—269

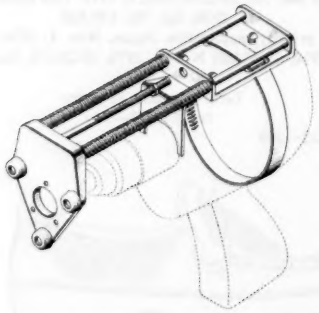
246,945
COFFEE SERVICE TRAY
David N. Shore, Derry, N.H., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Mar. 15, 1976, Ser. No. 667,131
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—21



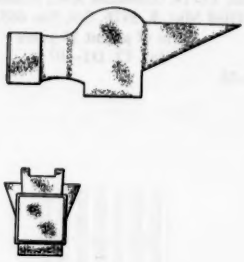
246,946
POWERED HAND-HELD DRILL
William H. Schultz, Northbrook, Ill., assignor to Skil Corporation, Chicago, Ill.
Filed Feb. 13, 1976, Ser. No. 657,852
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—68



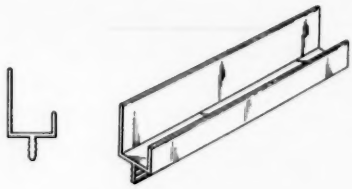
246,947
DRILL ALIGNMENT ATTACHMENT
Robert Lowe Glover, P.O. Box 335, Ash Fork, Ariz. 86320
Filed Oct. 26, 1976, Ser. No. 735,447
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



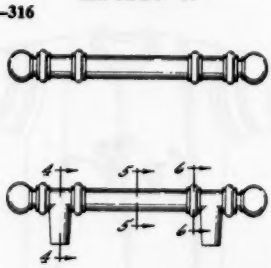
246,948
HAMMER HEAD
Martin V. Cunningham, 712 Cindy Lane, Petaluma, Calif. 94952
Filed Feb. 9, 1976, Ser. No. 657,128
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—79



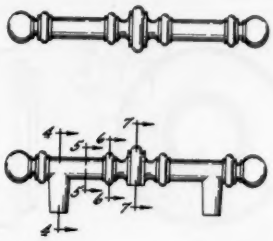
246,949
HANDLE FOR DRAWERS, DOORS, OR THE LIKE
Donald A. Davis, 50 Johnson Road, Winchester, Mass. 01890
Filed Nov. 8, 1976, Ser. No. 739,817
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—300



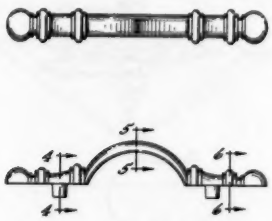
246,950
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,523
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—316



246,951
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,525
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—316



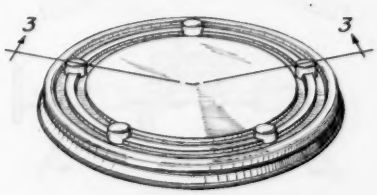
246,952
PULL
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,528
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—317



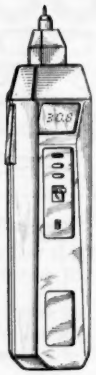
246,953
BOTTLE
William James Britt, Greenville, S.C., assignor to Morton-Norwich Products, Inc.
Filed June 14, 1976, Ser. No. 695,892
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

246,954
CONTAINER FOR FASHION ACCESSORY ARTICLES OR THE LIKE
Steven D. L'Europa, 869 Manton Ave., Providence, R.I. 02909
Filed Dec. 31, 1975, Ser. No. 645,827
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—238

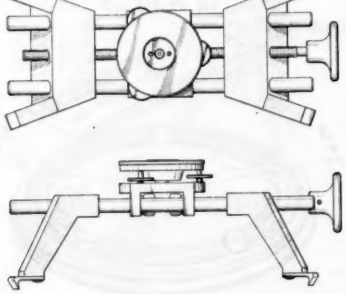
246,955
DISPOSABLE PLASTIC LID
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed June 17, 1976, Ser. No. 696,934
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—267



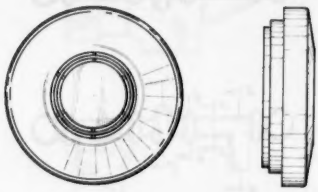
246,956
DIGITAL MULTIMETER OR THE LIKE
Francis O. Perry, Yardley, Pa., assignor to Logical Technical Services Corporation, New York, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,267
Term of patent 3½ years
Int. Cl. D10—*04*
U.S. Cl. D10—78



246,957
WHEEL ALIGNMENT INSTRUMENT CLAMP
Leonard A. Morrison, 1052 W. Altgeld St., Chicago, Ill. 60614; Leo C. Bogaerts, Rte. 2, Box 117, Antioch, Ill. 60002; Robert S. Hampton, Jr., 4901 Morse Ave., Skokie, Ill. 60076, and John Murphy, 3408 Win Haven Drive, Waukegan, Ill. 60085
Filed June 26, 1975, Ser. No. 590,445
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103



246,958
SMOKE DETECTOR
William J. Rakocy, Nutley, and Masao Tsuji, North Plainfield, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed May 20, 1976, Ser. No. 688,357
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

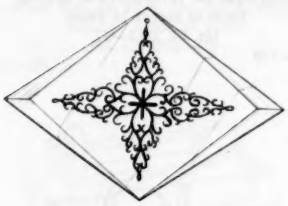


246,959
BRACELET
Ralph Jesse Guy, 421 Northwood Road, West Palm Beach, Fla. 33407
Filed June 1, 1976, Ser. No. 691,523
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

246,960
SLIP-ON BRACELET
Elio Lossini, Johnston, R.I., assignor to Raybeth Tool & Die Co., Inc., Providence, R.I.
Filed June 1, 1976, Ser. No. 692,030
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

246,961
JEWELRY PIN OR PENDANT
Patt Buchanan, Ramada Camp Inn, Dewey Rte., Prescott, Ariz. 76301
Filed Apr. 6, 1976, Ser. No. 674,728
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—53

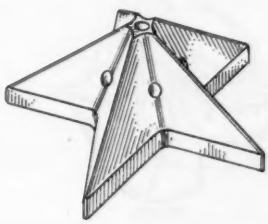
246,962
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,521
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—121



246,963
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,741
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—128

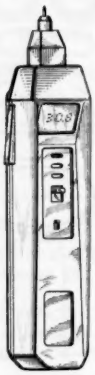
246,964
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,526
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

246,965
DISPLAY BASE FOR FLAGS AND THE LIKE
George W. Hughes, 2178 N. Orange Grove, Pomona, Calif. 91767
Filed Jan. 29, 1976, Ser. No. 653,433
Term of patent 14 years
Int. Cl. D11—*99*
U.S. Cl. D11—183

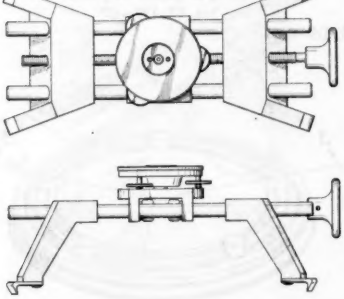


246,966
FOLDING GOLF CART
Edwin A. Nemeth, Martinez, Calif., assignor to P.N. Associates, Inc., Walnut Creek, Calif.
Filed June 30, 1976, Ser. No. 701,460
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—23

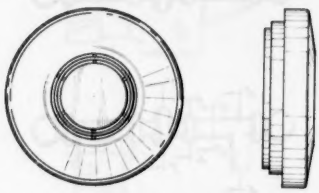
246,956
DIGITAL MULTIMETER OR THE LIKE
Francis O. Perry, Yardley, Pa., assignor to Logical Technical Services Corporation, New York, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,267
Term of patent 3½ years
Int. Cl. D10—*04*
U.S. Cl. D10—78



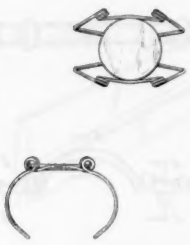
246,957
WHEEL ALIGNMENT INSTRUMENT CLAMP
Leonard A. Morrison, 1052 W. Altgeld St., Chicago, Ill. 60614; Leo C. Bogaerts, Rte. 2, Box 117, Antioch, Ill. 60002; Robert S. Hampton, Jr., 4901 Morse Ave., Skokie, Ill. 60076, and John Murphy, 3408 Win Haven Drive, Waukegan, Ill. 60085
Filed June 26, 1975, Ser. No. 590,445
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103



246,958
SMOKE DETECTOR
William J. Rakocy, Nutley, and Masao Tsuji, North Plainfield, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed May 20, 1976, Ser. No. 688,357
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



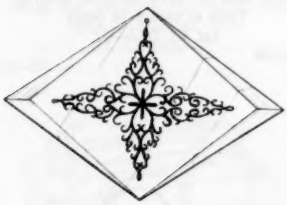
246,959
BRACELET
Ralph Jesse Guy, 421 Northwood Road, West Palm Beach, Fla. 33407
Filed June 1, 1976, Ser. No. 691,523
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4



246,960
SLIP-ON BRACELET
Elio Lossini, Johnston, R.I., assignor to Raybeth Tool & Die Co., Inc., Providence, R.I.
Filed June 1, 1976, Ser. No. 692,030
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

246,961
JEWELRY PIN OR PENDANT
Patt Buchanan, Ramada Camp Inn, Dewey Rte., Prescott, Ariz. 76301
Filed Apr. 6, 1976, Ser. No. 674,728
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—53

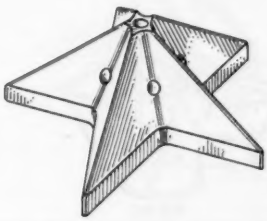
246,962
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,521
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—121



246,963
CHRISTMAS ORNAMENT
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Mar. 1, 1976, Ser. No. 662,741
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—128

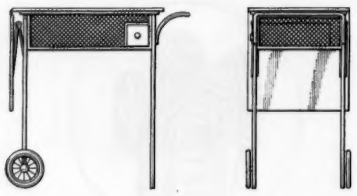
246,964
PLAQUE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 7, 1976, Ser. No. 674,526
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

246,965
DISPLAY BASE FOR FLAGS AND THE LIKE
George W. Hughes, 2178 N. Orange Grove, Pomona, Calif. 91767
Filed Jan. 29, 1976, Ser. No. 653,433
Term of patent 14 years
Int. Cl. D11—*99*
U.S. Cl. D11—183



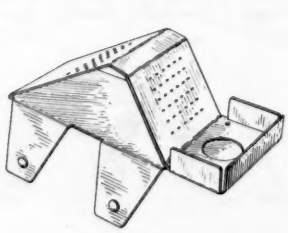
246,966
FOLDING GOLF CART
Edwin A. Nemeth, Martinez, Calif., assignor to P.N. Associates, Inc., Walnut Creek, Calif.
Filed June 30, 1976, Ser. No. 701,460
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—23

246,967
COMBINED SEWING MACHINE AND TEA CART
Salvatore J. Palazolo, 110 Avon Road, Memphis, Tenn. 38117
Filed July 6, 1976, Ser. No. 702,739
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—33

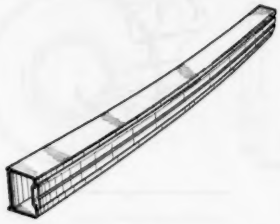


246,968
MOTORCYCLE PASSENGER SUPPORT
Paul Skiodowsky, 108 Hillcrest Road, Warren, N.J. 07060
Filed Mar. 8, 1976, Ser. No. 664,526
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—119

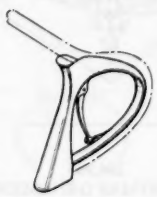
246,969
CB RADIO MOUNTING UNIT FOR AUTOMOBILES
John E. Mease, Kansas City, Mo., assignor to Ayers Plastics Company, Inc., Kansas City, Mo.
Filed July 16, 1976, Ser. No. 706,017
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



246,970
CAR BUMPER BAR
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Aug. 17, 1976, Ser. No. 715,004
Claims priority, application France, Mar. 1, 1976, 74598; Mar. 1, 1976, 74599
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

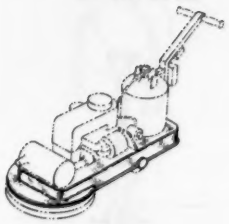


246,971
COMBINED BICYCLE HANDGRIP AND BRAKE LEVER
Terrell A. McKernon, 10083 Stimson Ave., and Thomas A. Krieger, 470 Bluff Drive, both of St. Louis, Mo. 63137
Filed June 10, 1976, Ser. No. 694,767
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—179

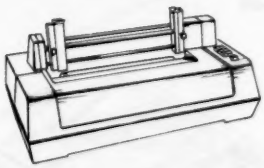


246,972
REMOTE STARTER SWITCH
David E. Maxwell, Cary; James R. Shaffer, Mt. Prospect, and Lee Radtke, Lake Zurich, all of Ill., assignors to Sun Electric Corporation, Chicago, Ill.
Filed Nov. 24, 1976, Ser. No. 744,697
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

246,973
BUFFER BASE HOUSING
Robert C. Deuchar, 209 Bayview Drive, San Carlos, Calif. 94070, and Gene J. Waitzman, 1055 Avondale St., San Jose, Calif. 95129
Continuation-in-part of Ser. No. 547,623, Feb. 2, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,635
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—48

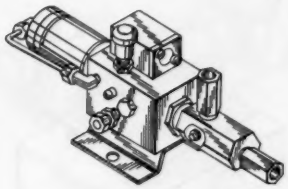


246,974
DATA PRINTER
Stanley E. Thorwaldsen, Grosse Pointe Farms, and David McElroy, St. Clair Shores, both of Mich., assignors to Sycor, Inc., Ann Arbor, Mich.
Filed Apr. 16, 1976, Ser. No. 677,535
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—50

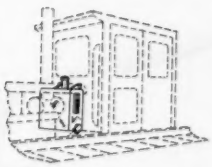


246,975
STAFF LOCATOR
Jan Hampf, Saro, Sweden, assignor to Ara-Bygg AB, Sweden
Filed Nov. 30, 1976, Ser. No. 746,145
Claims priority, application Sweden, June 4, 1976, 76-1215
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

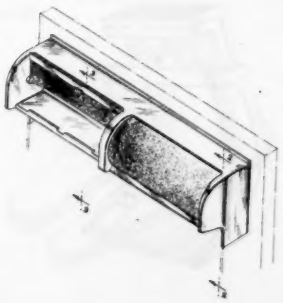
246,976
POSITIVE DISPLACEMENT PUMP
Robert R. Bell, and William H. Alexander, both of Houston, Tex., assignors to Vapor Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 626,464, Oct. 21, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 763,961
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D15—7



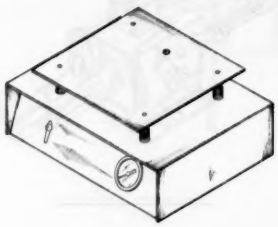
246,977
HYDRAULIC RESERVOIR FOR A TRACK LAYER VEHICLE
Sherrill M. Campbell, P.O. Box 388 S., Dos Palos, Calif. 93665
Filed Oct. 14, 1976, Ser. No. 732,342
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D15—28



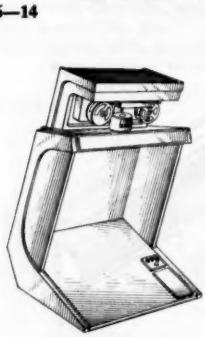
246,978
REFRIGERATOR DOOR COMPARTMENTS
William J. Armstrong, Jeffersontown, Ky., assignor to General Electric Company
Filed Aug. 30, 1976, Ser. No. 718,664
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—89



246,979
INVESTMENT CASTING APPARATUS FOR JEWELERS
David V. Estes, 7255 Richland Road, Fort Worth, Tex. 76118
Filed May 17, 1976, Ser. No. 686,784
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—135

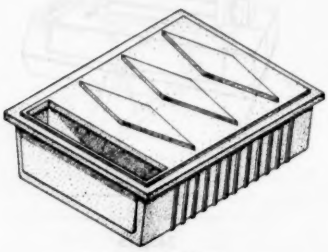


246,980
MICROFILM READER
Moto Shimano, Woodland Hills; Jack M. Duer, Garden Grove, and Edward R. Wadleigh, Hemet, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.
Filed May 27, 1976, Ser. No. 691,044
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—14



246,981
DRAWING COMPASS
Seisho Yamaguchi, Satte; Fujiro Nezu, Yokohama; Atsuko Kamoshida, Tokyo, and Hidenoir Shimizu, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Uchida Yoko
Division of Ser. No. 483,381, June 26, 1974, Pat. No. Des. 240,919.
This application Jan. 9, 1976, Ser. No. 647,747
Claims priority, application Japan, Feb. 1, 1974, 49-3515; Feb. 1, 1974, 49-3516
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—38

246,982
FILING CONTAINER
Jerry H. Hamilton, Route 1, Box 18C, Nine Mile Falls, Wash. 99026
Filed Mar. 8, 1976, Ser. No. 665,088
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92

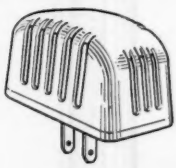


246,983
TELESCOPIC SIGHT MOUNT FOR RIFLES
Daniel L. Bechtel, 4901 Inwood Road, Fort Worth, Tex. 76109
Filed Jan. 17, 1977, Ser. No. 759,938
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

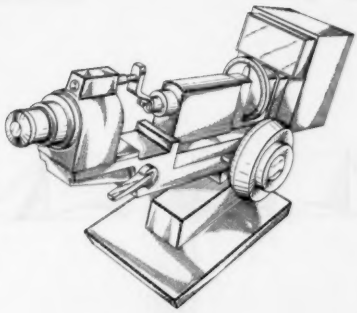
246,984
TELESCOPIC SIGHT MOUNT FOR RIFLES
Daniel L. Bechtel, 4701 Inwood Road, Fort Worth, Tex. 76109
Filed Jan. 17, 1977, Ser. No. 759,939
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

246,985
TOWEL WARMER
Vincent J. Popma, 9010 SW. 15th, and Jerome F. Moshofsky, 9019 SW. 15th, both of Portland, Oreg. 97219
Filed Mar. 22, 1976, Ser. No. 669,181
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77

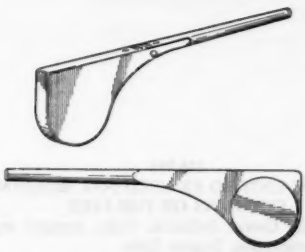
246,986
ELECTRIC VAPORIZER
Hal F. Costello, 4547 Nantucket Drive, Toledo, Ohio 43623
Filed Nov. 22, 1976, Ser. No. 743,711
Term of patent 7 years
Int. Cl. D23—*99*
U.S. Cl. D23—148



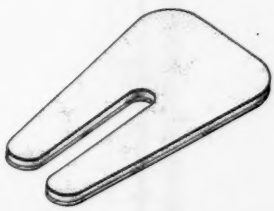
246,987
LENS MEASURING INSTRUMENT
Max Hawkins, Childs Hill Road, Woodstock, Conn. 06281
Filed Dec. 22, 1975, Ser. No. 642,859
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8



246,988
DENTAL FLOSS DISPENSER
William E. Bennington, 5 Fillmore Drive, Sarasota, Fla. 33577
Division of Ser. No. 367,953, June 7, 1973, Pat. No. Des. 237,498. This application Mar. 26, 1975, Ser. No. 562,193
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D28—64



246,989
SECUREMENT DEVICE FOR NASAL TUBE
Jerome D. Higgins, and Hazel L. Higgins, both of Loveland, Ohio, assignors to Xomed Inc., Cincinnati, Ohio
Filed May 26, 1976, Ser. No. 690,135
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—53



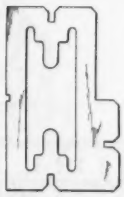
246,990
BUILDING
Lloyd H. Rain, Lexington, Ky., assignor to Irvin Industries Inc., Greenwich, Conn.
Filed Apr. 11, 1975, Ser. No. 567,352
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21

246,991
BUILDING UNIT TO BE USED FOR MOLDINGS, COLUMNS OR THE LIKE
Robert Franklin Green, Jefferson, Colo., assignor to Johns-Manville Corporation, Denver, Colo.
Division of Ser. No. 465,226, April 29, 1974, Pat. No. Des. 240,915. This application Dec. 22, 1975, Ser. No. 642,855
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

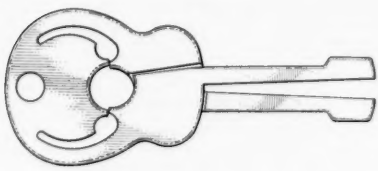
246,992
BUILDING MEMBER TO BE USED FOR MOLDINGS, COLUMNS OR THE LIKE
Robert Franklin Green, Morrison, Colo., assignor to Johns-Manville Corporation, Denver, Colo.
Division of Ser. No. 465,226, April 29, 1974, Pat. No. Des. 240,915. This application Dec. 22, 1975, Ser. No. 642,856
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

246,993
BUILDING UNIT TO BE USED FOR MOLDINGS, COLUMNS, OR THE LIKE
Robert Franklin Green, Morrison, Colo., assignor to Johns-Manville Corporation, Denver, Colo.
Division of Ser. No. 465,226, April 29, 1974, Pat. No. Des. 240,915. This application Dec. 22, 1975, Ser. No. 642,860
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

246,994
CONCRETE BLOCK
William J. Strader, 16100 Foliage Court, Rosemount, Minn. 55068
Filed June 18, 1976, Ser. No. 697,372
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



246,995
CIGARETTE HOLDER
John Herman, 8264 Gould Ave., Los Angeles, Calif. 90046
Filed June 21, 1976, Ser. No. 697,863
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—02

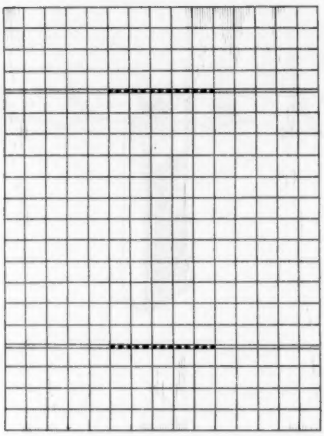


246,996
LIGHTER OR THE LIKE
Kaname Ichikawa, Tokyo, Japan, assignor to Modern Royal Co., Ltd.
Filed Aug. 18, 1976, Ser. No. 715,509
Claims priority, application Japan, Feb. 25, 1976, 51-6097
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

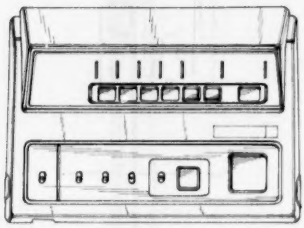
246,997
CIGARETTE GAS LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki, Ltd., Yokohama, Japan
Filed Aug. 3, 1976, Ser. No. 711,365
Claims priority, application Japan, June 17, 1976, 51-23016
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

246,998
COMBINED FLUID DISPENSER AND APPLICATOR FOR SCALP
Timothy Lee Hill, 17419 Monica, Detroit, Mich. 48221
Filed May 21, 1976, Ser. No. 688,530
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

246,999
CHESS FOOTBALL GAME BOARD
Selmer Hjelmeland, 16005 7th Ave. S.W., Seattle, Wash. 98166
Filed Dec. 1, 1975, Ser. No. 636,439
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 FG

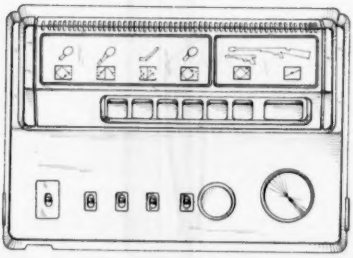


247,001
CONTROL CONSOLE FOR T. V. GAME
Akira Katoh, Tokyo, Japan, assignor to Lloyd's Electronics, Inc.
Filed June 3, 1976, Ser. No. 692,582
Term of patent 3½ years
Int. Cl. C21—*01*
U.S. Cl. D34—5 R



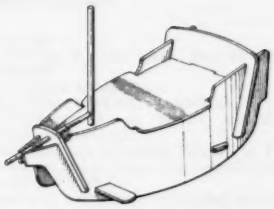
247,000
DOLL OR SIMILAR ARTICLE
Lisa A. Cafolla, Box 86, Waterloo, N.Y. 13165
Filed Apr. 16, 1976, Ser. No. 677,774
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

247,002
CONTROL CONSOLE FOR T. V. GAME
Akira Katoh, Tokyo, Japan, assignor to Lloyd's Electronics, Inc.
Filed Aug. 30, 1976, Ser. No. 718,663
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5 R

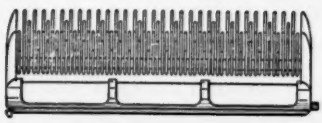


247,003
HOBBY HORSE
Lester E. Walker, 1265 Old Orchard Village, St. Louis, Mo. 63011
Filed Feb. 28, 1972, Ser. No. 230,193
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AE

247,004
TOY BOAT
Eric Kyte, Ilkley, England, assignor to Bulldog Toy Company Limited, England
Filed Dec. 11, 1975, Ser. No. 639,937
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



247,005
HAIR STYLER ATTACHMENT
Morison S. Cousins, Plainview; Michael A. Cousins, Huntington, both of N.Y., and Greydon A. Rhodes, III, Noroton, Conn., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 23, 1976, Ser. No. 660,620
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—18



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JANUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Akerlund & Rausing: *See—*
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Abdul-Rahman, Yahia A. K., to Atlantic Richfield Company. Feed system for a conoidal solids separating system and method of separating. 4,068,758, Cl. 209-112.000.

Abdul-Rahman, Yahia A. K., to Atlantic Richfield Company. Conoidal solids separator with special scraper and separating method. 4,068,759, Cl. 209-112.000.

Abe, Sigeya: *See—*
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Abei, Hiroko. Method for automatic, continuous selective plating on a tape member. 4,069,109, Cl. 204-15.000.

Abei, Hiroko. Apparatus for automatic, continuous selective plating on a tape member. 4,069,126, Cl. 204-224.00R.

Aboulafia, Joseph; Le Fustec, Richard; and Schranz, Claude, to Compagnie Francaise de Raffinage; and Groupement Europeen de la Cellulose. Process for the production of polyolefin fibers. 4,069,287, Cl. 264-140.000.

Abrams, Edward; and Masella, Anthony J., to Chemetron Corporation. Waste water treatment with oxygen. 4,069,147, Cl. 210-6.000.

ACF Industries, Incorporated: *See—*
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Adamson, Arthur P., to United States of America, National Aeronautics and Space Administration. Variable thrust nozzle for quiet turbofan engine and method of operating same. 4,068,469, Cl. 60-204.000.

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Adelstein, Gilbert W., to G. D. Searle & Co. 4-Aminomethyl-1-(3,3,3-triarylpropyl)-4-arylpiperidine and derivatives thereof. 4,069,223, Cl. 260-293.760.

Adlam, Christopher; and Reid, David Eric. Glycopeptide extract. 4,069,314, Cl. 424-92.000.

Afanasiev, Vladimir Konstantinovich: *See—*
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,068,459, Cl. 57-156.000.

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AGFA-Gevaert Aktiengesellschaft: *See—*
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Akazawa, Hakuichi; and Nishimura, Kenichi, to Taki Chemical Co., Ltd. Process for producing α-type calcium sulfate hemihydrate. 4,069,300, Cl. 423-555.000.

AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See—*
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Alger, Donald L.; Schwab, William B.; and Furman, Edward R., to United States of America, National Aeronautics and Space Administration. Closed loop spray cooling apparatus. 4,068,495, Cl. 62-376.000.

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Allen, John. Method of and apparatus for producing musical instrument keyboard-controlled pitch variation, tone alteration and the like. 4,068,552, Cl. 84-1.060.

Allen, Joseph C., to Texaco Inc. Oil recovery process utilizing aromatic solvent and steam. 4,068,716, Cl. 166-271.000.

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Allison, Arthur F.; Christopherson, Dennis C.; Mays, Byron L.; and Reed, Reginald A., to Cutler-Hammer, Inc. Combined ejector-gate means for rotatable table of an article counter-stacker. 4,068,567, Cl. 93-93.00C.

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Anbergen, Henricus J.; and McCabe, Peter, to Addressograph-Multigraph Corporation. Conveyor and three-roller sheet deflector for sheet distributor. 4,068,838, Cl. 271-173.000.

Andersen, Heinz-Erhardt, to Hoechst Aktiengesellschaft. Wall covering. 4,068,439, Cl. 52-497.000.

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Baker, David Clarkston; and Haskell, Theodore Herbert, to Parke, Davis & Company. 9-(5-O-Acyl-β-D-arabinofuranosyl)adenine compounds. 4,069,382, Cl. 536-26.000.

Baker Perkins Holdings Limited: *See*—
Dacey, Raymond Gwilym; and Verity, Richard Hugh, 4,068,993, Cl. 425-104.000.

Baldassari, Paolo, to Reggiane Officine Meccaniche Italiane S.p.A. Extraction of fertilizer salts and organic substances of high nutritive value from industrial waste waters. 4,069,033, Cl. 71-25.000.

Ball, D. Graham, to Rader Companies, Inc. Method of backfilling pipeline trenches. 4,068,488, Cl. 61-105.000.

Ball, Frank J., to Westvaco Corporation. Cement composition. 4,069,063, Cl. 106-97.000.

Ball, Kirby L.; Nance, Glenn S.; and Turner, Roy J., to Armstrong Cork Company. Bed locking insert plates. 4,068,332, Cl. 5-296.000.

Ballard, David B.; Ogburn, Fielding; and Young, John P., to United States of America, Commerce. Scanning electron microscope micrometer scale and method for fabricating same. 4,068,381, Cl. 33-1.00R.

Balme, Roy; and Perkins, John Francis, to Charles S. Madan & Company Limited. Piston pumps driven by fluid-actuated piston having a constant fluid force against the small area surface. 4,068,983, Cl. 417-401.000.

Band, Pieter: *See*—
Johnson, Ben C.; and Band, Pieter, 4,068,966, Cl. 403-397.000.

Banjulis, Vladas Klemovich: *See*—
Yanushonis, Styapas Styapono; Belyauskas, Bronjus-Vitautas Bronyaus; Sherkuvene, Vida-Katrina Jule; and Banjulis, Vladas Klemovich, 4,069,074, Cl. 148-188.000.

Banks, Peter Baldwin: *See*—
Nelson, Peter David; and Banks, Peter Baldwin, 4,069,502, Cl. 358-113.000.

Banyu Pharmaceutical Co., Ltd.: *See*—
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Hosoi, Masaaki; and Aoki, Nobuo, 4,069,254, Cl. 260-556.0AR.

Bara, Anton: *See*—
Meyer, Walter; and Bara, Anton, 4,068,974, Cl. 401-150.000.

Barchietto, Giacomo: *See*—
Hoegl, Helmut; and Barchietto, Giacomo, 4,069,046, Cl. 96-1.0PC.

Bardet, Gerard, to Automatisme & Technique. Element of vehicle running on railway tracks. 4,068,598, Cl. 104-130.000.

Baringer, B. E., to Kasle Steel Corporation. Unloader for press. 4,068,519, Cl. 72-426.000.

Barker, Sidney Alan; Somers, Peter John; Woodbury, Robin Ross; and Stafford, Geoffrey Harry, to Imperial Chemical Industries Limited. Conversion of aldose to ketose in the presence of oxyanions or mixed oxyanions of tin or germanium. 4,069,104, Cl. 195-31.00F.

Barkhuff, Raymond A., Jr.; and Sprenkle, William E., Jr., to Monsanto Company. Method for preparing fire retardant molding compositions. 4,069,288, Cl. 264-141.000.

Barlow, Gordon A.: *See*—
Kuna, Wayne A.; Kulesza, Ralph J.; and Barlow, Gordon A., 4,068,841, Cl. 272-8.00R.

Barloy, Michel, to Rhone-Poulenc Industries. Vacuum filtration process employing a circular vacuum box. 4,069,154, Cl. 210-66.000.

Barmore, Barbara Ann. Orthopedic toenail device. 4,068,656, Cl. 128-81.00A.

Barnett, James V., II; Mayer, Ernest F.; Pfeiffer, James W.; and Wickwar, Larry D., to Fairchild Camera and Instrument Corporation. Shock resistant wristwatch module. 4,068,464, Cl. 58-50.00R.

Barrett, Bruce Robert; and Chapman, Alan Stanley John, to Northern Electric Company, Limited. TDM PCM Communication system. 4,069,399, Cl. 179-15.0AL.

Bartlett, James L.: *See*—
Nau, Paul R.; Bartlett, James L.; and Gund, Heinz K., 4,068,636, Cl. 123-119.00B.

Bartram, James F., to Raytheon Company. Doppler spectral measurement. 4,069,468, Cl. 340-3.00D.

BASF Aktiengesellschaft: *See*—
Hoffmann, Werner; and von Fraunberg, Karl, 4,069,258, Cl. 260-598.000.
Nett, Robert; Fechner, Wolf Dieter; Jettmar, Werner; Polster, Rudolf; Sappok, Reinhard; and Hartmann, Eduard, 4,069,064, Cl. 106-193.00P.
Zanker, Fritz, 4,069,238, Cl. 260-453.00P.

Bass, Michael; Garmire, Elsa; and McMahon, Thomas R., to University of Southern California. Flexible wave guide for laser light transmission. 4,068,920, Cl. 350-96.0WG.

Battelle Development Corporation: *See*—
Voinov, Michel, 4,069,372, Cl. 429-104.000.

Batts, Robert Lee, to Johns-Manville Corporation. Assembly for applying liquid to elongated material. 4,068,619, Cl. 118-122.000.

Baud, Christian; Raverdy, Yvan; and Hougeot, Henri, to Thomson-CSF. Method for producing microscopic passages in a semiconductor body for electron-multiplication applications. 4,069,121, Cl. 204-129.300.

Baugh, William D.: *See*—
Horvitz, David; and Baugh, William D., 4,069,232, Cl. 260-343.600.

Baum, Sidney J.; and Mayr, Anton J., to Foster Grant Co., Inc. Apparatus for treating plastic film. 4,068,616, Cl. 118-8.000.

Baumgartner, Frank, to Pacon Manufacturing Corporation. Towel tabbing machine and method. 4,069,077, Cl. 156-152.000.

Bausch & Lomb Incorporated: *See*—
Howe, James D., 4,069,417, Cl. 362-330.000.
Morton, Roger R., 4,069,411, Cl. 235-92.0PC.

Baxter Travenol Laboratories, Inc.: *See*—
Parsons, George H., Jr., 4,069,352, Cl. 427-2.000.
Winchell, David A., 4,068,696, Cl. 150-8.000.

Bayer Aktiengesellschaft: *See*—
Ebeling, Wilfried; and Schulte, Klaus, 4,068,831, Cl. 366-156.000.
Elfert, Klaus; Hinz, Jurgen; and Binsack, Rudolf, 4,069,215, Cl. 260-79.30R.
Findeisen, Kurt; Draber, Wilfried; and Schwarz, Herbert, 4,069,252, Cl. 260-545.00R.
Lantzsch, Reinhard; and Arlt, Dieter, 4,069,257, Cl. 260-595.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,069,334, Cl. 424-273.00P.
Schellhammer, Carl Wolfgang; and Seng, Florin, 4,069,228, Cl. 260-308.00R.
Simm, Walter; Gosling, Claus; Bonart, Richard; and von Falkai, Bela, 4,069,026, Cl. 55-6.000.

Bazin, Lucas John, to RCA Corporation. Signal comparator circuit. 4,069,432, Cl. 307-357.000.

BBC, Brown, Boveri & Company Limited: *See*—
Beckershoff, Wolfgang, 4,068,958, Cl. 403-8.000.

Beach, Ivan: *See*—
Beach, Roy; and Beach, Ivan, 4,068,969, Cl. 404-98.000.

Beach, Roy; and Beach, Ivan. Gutter attachment for asphalt spreader. 4,068,969, Cl. 404-98.000.

Beaudette, Real J.; and Krieg, Harold Patrick, to Singer Company, The. Switching apparatus for electrically contacting conductive terminals on a circuit-carrying board. 4,069,403, Cl. 200-51.120.

Beck, Heinz; Muller, Klaus; and Erdelen, Gerhard, to Glyco-Metall-Werke Daelen & Loos GmbH. Mounting and holding fixture for electroplating uniform thickness metallic deposits. 4,069,131, Cl. 204-297.00W.

Beck, Richard William, to Deseret Pharmaceutical Co., Inc. Catheter placement assembly improvement. 4,068,660, Cl. 128-214.400.

Becka, Michael M., to International Shoe Machine Corporation. Machine for clamping the heel portion of an upper to the corresponding portion of a form. 4,068,336, Cl. 12-14.400.

Beckerman, Joseph W., to Massey-Ferguson Inc. Transmission control. 4,068,540, Cl. 74-476.000.

Beckershoff, Wolfgang, to BBC, Brown, Boveri & Company Limited. Differentially bolted joint. 4,068,958, Cl. 403-8.000.

Beckman Instruments, Inc.: *See*—
Polito, Alan J.; and Knight, William S., 4,069,305, Cl. 424-1.000.

Begany, Albert J.: *See*—
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,069,343, Cl. 424-319.000.

Behnke, Edward R.: *See*—
Schreyer, Kenneth D.; and Behnke, Edward R., 4,068,467, Cl. 59-93.000.

BEI Electronics, Inc.: *See*—
Foley, Nelson D., 4,068,556, Cl. 89-1.814.

Belanger, Gerard, to Tecnobec, Inc. Apparatus for lifting the bolster of a railway car truck. 4,068,823, Cl. 254-89 20H.

Bell, Arthur O. Firearm sight light. 4,069,414, Cl. 362-110.000.

Bell, Douglas M., to Handi-Kup Company. Port protective ring in a male mold. 4,068,819, Cl. 249-66.00A.

Bell, Malcolm R., to Sterling Drug Inc. 2-Substituted-indole-1-lower-alkanecarboxamides having anti-secretory or anti-ulcer activity. 4,069,337, Cl. 424-274.000.

Bell Telephone Laboratories, Incorporated: *See—*
Goldenberg, Henry Robert; Peck, Richard John; Tong, Shih Yung; and Webb, David Allen, 4,069,392, Cl. 178-58.00R.
Nash, Donald Henry, 4,069,395, Cl. 179-1.00P.

Bell, Terry Lee; Call, Lyle G.; Dillan, George Omer; Jackson, James Phillip, Jr.; and Johnson, Larry Albin, to International Business Machines Corporation. Component insertion machine. 4,068,373, Cl. 29-741.000.

Beloit Corporation: *See—*
Zink, Stanley C.; and Penrod, William R., 4,069,092, Cl. 156-500.000.

Belyauskas, Bronjus-Vitautas Bronyaus: *See—*
Yanushonis, Styapas Styapono; Belyauskas, Bronjus-Vitautas Bronyaus; Sherkuvene, Vida-Katrina Jule; and Banjulis, Vladas Klemovich, 4,069,074, Cl. 148-188.000.

Benatti, Edmo: *See—*
Schmid, Herbert, Jr.; and Benatti, Edmo, 4,068,559, Cl. 90-11.00D.

Bendix Corporation, The: *See—*
DeBard, James Edward; Borden, Raymond Walter; and Tumpey, John Joseph, 4,068,368, Cl. 29-588.000.
Deem, Brian Charles; and Karon, Marc Alan, 4,068,902, Cl. 303-28.000.
Markert, Matthew Edward, 4,068,744, Cl. 188-73.300.
Watson, Edwin B.; and Brack, Charles V., 4,068,640, Cl. 123-139.0AT.

Bennett, David E.; Trasatti, Terrence S.; and Peterson, Lawrence D., to General Motors Corporation. Engine with noise reducing exhaust valve arrangement. 4,068,630, Cl. 123-75.00C.

Benson, George E., to Industrial Carbide Tooling Incorporated. Stacked disc finger joint cutter assembly. 4,068,688, Cl. 144-90.00A.

Bensussan, Andre; and Levaillant, Claude, to C.G.R. MeV. Microwave systems for eliminating spurious signals from pulsed source. 4,069,456, Cl. 328-165.000.

Benthin, Johannes, to MFB-Neuwerk Mechanische Fensterbehange GmbH. Spraying device for use in toilets. 4,068,325, Cl. 4-7.000.

Berard, Raymond A.: *See—*
DiSalvo, Gail D.; and Berard, Raymond A., 4,068,849, Cl. 273-218.000.

Berger, Herbert; Gall, Rudi; Thiel, Max; Schaumann, Wolfgang; and Vomel, Wolfgang, to Boehringer Mannheim GmbH. Nitropyrazole compounds and anti-microbial compositions. 4,069,330, Cl. 424-267.000.

Berger, Leon H. Retractable heat shield for vehicles. 4,068,885, Cl. 296-78.00R.

Berger, Sol J. Suspension hanger. 4,068,817, Cl. 248-340.000.

Berkey Photo, Inc.: *See—*
Graham, Thomas G.; Maltese, John; Nesson, Israel; and Mitchell, Robert, 4,069,490, Cl. 354-83.000.

Berliner Maschinenbau-AG vormals L. Schwartzkopff: *See—*
Luther, Gerhard, 4,068,358, Cl. 28-272.000.

Berman, Robert A. Intubating pharyngeal airway. 4,068,658, Cl. 128-208.000.

Bernardi, Dario. Awning type sunshade. 4,068,673, Cl. 135-5.00R.

Bernauer, Joachim: *See—*
Frey, Rudolf; Bernauer, Joachim; and Gobel, Pirmin, 4,068,586, Cl. 101-415.100.

Berringer, Robert T.; and Machado, Octavio J., to Westinghouse Electric Corporation. Nuclear core region fastener arrangement. 4,069,102, Cl. 176-87.000.

Bertetto, Donald W.: *See—*
Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., 4,068,337, Cl. 12-142.00P.

Bertocchio, Rene; and Foulletier, Louis, to Produits Chimiques Ugine Kuhlmann. Fire extinguishing compositions. 4,069,158, Cl. 252-3.000.

Bertus, Brent J.: *See—*
Hessert, James E.; and Bertus, Brent J., 4,068,714, Cl. 166-246.000.
Hessert, James E.; Bertus, Brent J.; and Johnston, Chester C., Jr., 4,068,720, Cl. 166-282.000.

Betts, Robert E., to United States of America, Army. Ignition system used in testing solid propellant compositions for smokelessness. 4,068,591, Cl. 102-70.00R.

Beuchat, Roger, to Mefina S.A. Electronic firing device for projectiles. 4,068,592, Cl. 102-70.20R.

Bewerse, Richard A.; and Joseloff, Stanley. Paper bag opening device. 4,068,451, Cl. 53-385.000.

Beyer, Klaus D.; Das, Gobinda; Poponiak, Michael R.; and Yeh, Tsu-Hsing, to International Business Machines Corporation. Semiconductor fabrication method for improved device yield by minimizing pipes between common conductivity type regions. 4,069,068, Cl. 148-1.500.

Bezemek, Vladislav: *See—*
Machacek, Frantisek; Bezemek, Vladislav; Kudlacek, Dusan; Kliment, Lubomir; Pirek, Arnost; Smejkal, Vladimir; Svoboda, Frantisek; and Vach, Stanislav, 4,068,320, Cl. 2-227.000.

Bickel, Hans: *See—*
Wiederkehr, Rene; and Bickel, Hans, 4,069,324, Cl. 424-246.000.

Bilek, Frank Thomas, to Texas Instruments Incorporated. Flexible magnetic disc recording system. 4,069,508, Cl. 360-99.000.

Billing, Rudolph W.; and Castle, George K., to Avco Corporation. Structural support for char derived from intumescent coatings. 4,069,075, Cl. 156-82.000.

Binder, Josef. Handle for a hand implement such as a rake, a broom, or the like. 4,068,346, Cl. 16-110.00R.

Binsack, Rudolf: *See—*
Elfert, Klaus; Hinz, Jurgen; and Binsack, Rudolf, 4,069,215, Cl. 260-79.30R.

Binstock, Morton H., to Westinghouse Electric Corporation. Flow control for once-through boiler having integral separators. 4,068,475, Cl. 60-646.000.

Bio-Dynamics Inc.: *See—*
Townley, Charles O.; Vegell, Allan; and Eaby, Daniel G., 4,068,324, Cl. 3-1.913.

Bio-Pet Research Company: *See—*
Ramney, Tiberius, 4,068,624, Cl. 119-106.000.

Birks, Cedric Gwilliam, to CCL Systems Limited. Cable or rope clamp. 4,068,962, Cl. 403-212.000.

Bjorshol, Kolbjorn. Apparatus for use in long-line fishing. 4,068,399, Cl. 43-4.500.

Black, Chester A.; and Black, Lester A. Detachable road protecting device for tracked vehicles. 4,068,905, Cl. 305-51.000.

Black, Lester A.: *See—*
Black, Chester A.; and Black, Lester A., 4,068,905, Cl. 305-51.000.

Blaetz, Philip H., to Kraft, Inc. Dasher. 4,068,832, Cl. 366-280.000.

Blake, Robert J.; and Roy, Guy W., to Stauffer Chemical Company. Fluidized deoxychlorination catalyst composition. 4,069,170, Cl. 252-441.000.

Blewett, C. William: *See—*
Hutchison, Robert B.; and Blewett, C. William, 4,069,236, Cl. 260-414.000.

Blomberg, Folke Ivar; and Holst, Jan-Olov Martin. Anti-locking brake apparatus and method. 4,068,904, Cl. 303-115.000.

Bloom, Stewart D.: *See—*
Harney, Robert C.; and Bloom, Stewart D., 4,068,953, Cl. 356-75.000.

Bloom, William M., to Allegheny Ludlum Industries, Inc. Method and apparatus for heating a workpiece. 4,069,008, Cl. 432-8.000.

Blount, David H. Process for the production of poly(allyl silicofurmate). 4,069,391, Cl. 526-17.000.

Bluebird International, Inc.: *See—*
Zehrung, Claude D., Jr.; Urie, Clarence L.; and Martinez, Joseph C., 4,068,455, Cl. 56-344.000.

Blum, Helmut; and Worms, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien. Production of 1-hydroxy-alkane-1,1-diphosphonic acids. 4,069,246, Cl. 260-502.40P.

Blumenthal, Jack L.: *See—*
Starkovich, John A.; and Blumenthal, Jack L., 4,069,304, Cl. 423-648.00R.

Bobbe, Richard M., to Xerox Corporation. Variable contrast optical screening system. 4,068,940, Cl. 355-4.000.

Bobbitt, Donald E., to A. B. Chance Company. Lightweight, screw anchor supported foundation and method of installing same. 4,068,445, Cl. 52-743.000.

Bobenrieth, Albert, to Thomson-CSF. Novel integrated circuit and method of manufacturing same. 4,069,493, Cl. 357-22.000.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See—*
Konig, Eberhard, 4,068,529, Cl. 73-423.00A.

Bodinger, Donald C.; Tombers, Paul A.; and Snyder, Richard C., to Pullman Incorporated. Door track construction. 4,068,411, Cl. 49-408.000.

Bodlaj, Viktor, to Siemens Aktiengesellschaft. Contact-free thickness measuring method and device. 4,068,955, Cl. 356-167.000.

Bodor, Nicolae S.; and Sloan, Kenneth B., to INTERx Research Corporation. Pro-drugs for the improved delivery of certain selected anti-inflammatory steroids. 4,069,322, Cl. 424-241.000.

Boehringer Ingelheim GmbH: *See—*
Langbein, Adolf; Merz, Herbert; Walther, Gerhard; and Stockhaus, Klaus, 4,069,328, Cl. 424-266.000.
Langbein, Adolf; Danneberg, Peter; and Kuhn, Franz Josef, 4,069,331, Cl. 424-267.000.

Boehringer Mannheim GmbH: *See—*
Berger, Herbert; Gall, Rudi; Thiel, Max; Schaumann, Wolfgang; and Vomel, Wolfgang, 4,069,330, Cl. 424-267.000.

Boehringer, Wilfred E., to McDonnell Douglas Corporation. Foldable inclined multi-section ramp actuation system. 4,068,770, Cl. 214-85.000.

Boeing Company, The: *See—*
Chatwin, Maurice Stephen; and Porter, George Zell, 4,068,813, Cl. 248-119.00R.

Boettcher, Charles E.; Karp, Joel A.; Reed, John A.; and Varadi, Andrew G., to National Semiconductor Corporation. MOS Dynamic random access memory having an improved sensing circuit. 4,069,474, Cl. 365-205.000.

Boettcher, Charles E., to National Semiconductor Corporation. MOS Dynamic random access memory having an improved sense and restore circuit. 4,069,475, Cl. 365-205.000.

Bogdanov, Eduard Alimovich: *See—*
Dzhaparidze, Levan Nikolaevich; Chakhunashvili, Temuri Alexandrovich; Mainsuradze, Venera Romanovna; Chagunava, Raul Vladimirovich; Kervalishvili, Zurab Yasonovich; Sikharulidze, Nodar Georgievich; Otiashvili, Dali Georgievna; Dubov, Yauzhe Markovich; Bogdanov, Eduard Alimovich; Gogoladze, Georgy Trofimovich; Teisheva, Alla Abelevna; Ryzygraeva, Galina Nikolaevna; Melnikov-Eikhenvald, Mikhail Alexeevich; and Rokva, Temuri Valeryanovich, 4,069,116, Cl. 204-96.000.

Boggs, Roger L., to Caterpillar Tractor Co. Vehicle wheel having radially movable impact absorbing rims. 4,068,698, Cl. 152-27.000.

Bokemeyer, Reinhard: *See—*
Stuckmann, Dieter; Jutte, Hans; Babendererde, Siegmund; and Bokemeyer, Reinhard, 4,068,485, Cl. 61-85.000.

Boliden Aktiebolag: *See—*
Gorling, Karl Goran; Edenwall, Ingvar A. O.; Jansson, Jan-Olof; and Mioen, Thomas K., 4,069,041, Cl. 75-101.00R.

Bollinger, Parker A., Jr.; and Frymark, Norbert F., to Allen-Bradley Company. Bimetal overload relay. 4,069,464, Cl. 337-77.000.

Bollmer, Jacob A., to Dayco Corporation. Printing blanket holding apparatus. 4,068,587, Cl. 101-415.100.

Bombara, Dennis Michael: *See—*
Camp, Edward C.; Enos, Ellsworth C.; and Bombara, Dennis Michael, 4,068,412, Cl. 51-5.00D.

Bonart, Richard: *See—*
Simm, Walter; Gosling, Claus; Bonart, Richard; and von Falkai, Bela, 4,069,026, Cl. 55-6.000.

Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., to Ford, Bacon & Davis Texas Inc. Production of reducing gases. 4,069,020, Cl. 23-262.000.

Bonnice, Phillip E., to General Electric Company. Grinding wheel dressing method. 4,068,416, Cl. 51-325.000.

Booth, Eugene E.: *See—*
Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., 4,069,007, Cl. 432-3.000.

Booth, Richard A.; Weil, Denis C.; and Yanofsky, Daniel N., to Pitney-Bowes, Inc. Document handling device. 4,068,949, Cl. 355-75.000.

Borden, Raymond Walter: *See—*
DeBard, James Edward; Borden, Raymond Walter; and Tumpey, John Joseph, 4,068,368, Cl. 29-588.000.

Borg-Warner Corporation: *See—*
Gatewood, Sidney Ulane, 4,068,750, Cl. 192-111.00A.

Borman, Willem Frederik Hendrik; Craft, Donald Irving; and Kramer, Mortor, to General Electric Company. Process of making a high melt viscosity block co-polyester. 4,069,278, Cl. 260-860.000.

Bornstein, Leopold F., to Georgia-Pacific Corporation. Low-pressure, no-cool phenolic type resin for decorative laminates. 4,069,276, Cl. 260-839.000.

Bortner, Allen A., to Charles Offset Company, Inc. Apparatus for assembling take-one advertising displays. 4,068,835, Cl. 270-53.000.

Bos, Cornelis Arie: *See—*
Buysman, Petrus Johannes; Vermeulen, Gerardus Antonius Wilhelmus; and Bos, Cornelis Arie, 4,069,085, Cl. 156-345.000.

Bottemiller, Merton M., to Homecrest Industries, Inc. Recliner chair. 4,068,888, Cl. 297-317.000.

Bourdel, Jacques, to Commissariat a l'Energie Atomique. Device for localizing light phenomena. 4,069,421, Cl. 250-363.00S.

Bourdon, Leo; Burley, Richard K.; and Kennedy, Clifford F., to Bourdon, Leo; Burley, Richard K.; and Kennedy, Clifford F. Solar heating unit. 4,068,653, Cl. 126-271.000.

Bourgeois, Norbert, to ASA S.A. Interlocking cams. 4,068,498, Cl. 66-57.000.

Bourgeois, Norbert Paul, to ASA S.A. Device for driving needle beds in a circular knitting machine. 4,068,496, Cl. 66-27.000.

Bouton, William J., Jr.: *See—*
Testa, Carmen; and Bouton, William J., Jr., 4,068,873, Cl. 292-101.000.

Boyden, Julian William, to Albright & Wilson Limited. Dialkylphenol phosphorylation. 4,069,279, Cl. 260-975.000.

Boyer, Jo Clara, to Saviano, A.G. Apparatus for forming an end closure in a tubular knitted article. 4,069,090, Cl. 156-498.000.

Brack, Charles V.: *See—*
Watson, Edwin B.; and Brack, Charles V., 4,068,640, Cl. 123-139.0AT.

Brand, Werner; Schillings, Dieter; Geers, Leo; and Pietrowski, Edmund, to Waggonfabrik Uerdingen A.G. Drive arrangement for transport vehicles. 4,068,542, Cl. 74-625.000.

Brandestini, Antonio, to Bureau BBR Ltd. Means anchoring a bundle of wires in a socket. 4,068,963, Cl. 403-268.000.

Brandt, Paul W.; and Somerville, Dean S. Locking puller device. 4,068,365, Cl. 29-261.000.

Braun, Leroy O.: *See—*
Erbert, Virgil; and Braun, Leroy O., 4,068,952. Cl. 356-5.000.

Brax, Jean Albert, to Societe Generale pour l'Emballage. Forehearth for glass furnace. 4,069,032, Cl. 65-337.000.

Breeckner, Gregory P. Motorcycle clutch tool. 4,068,544, Cl. 81-3.00R.

Breitenstein, Charles Thomas; and Holecek, Allen Roland, to Spiral Step Tool Company. Automatic flute grinding machine. 4,068,414, Cl. 51-95.0LH.

Brems, John H.; Kobane, John, Jr.; and Zetner, Wilfred J., to F. Jos. Lamb Company. Transfer bar coupling. 4,068,957, Cl. 403-8.000.

Briar, Jack, to Allied Industries of Kansas, Inc. Flexible cutting line and rotor therefor. 4,068,376, Cl. 30-276.000.

Briggs & Stratton Corporation: *See—*
Nau, Paul R.; Bartlett, James L.; and Gund, Heinz K., 4,068,636, Cl. 123-119.00B.

British Petroleum Company Limited, The: *See—*
Lauder, Brian Tait; and Rolfe, John Robert Kenneth, 4,069,142, Cl. 208-310.00Z.

British Steel Corporation: *See—*
Hetherington, Matthew J.; Lewis, Richard; and Goode, Graham E., 4,068,523, Cl. 73-628.000.
Lewis, Richard; and Parker, Michael J., 4,068,524, Cl. 73-598.000.

Brock, Gregory K.: *See—*
Karna, John D.; Brock, Gregory K.; and Shellhammer, Daniel M., 4,069,018, Cl. 23-232.00E.

Brock, J. Farny. Associating drill chuck keys with drill. 4,068,978, Cl. 408-241.00R.

Brodin, Eric. Automatic ventilation regulating device for windows, doors and the like. 4,068,799, Cl. 236-49.000.

Brois, Stanley J.; Ryer, Jack; and Winans, Esther, to Exxon Research & Engineering Co. Carboxylate esters of 1-aza-3,7-dioxabicyclo[3.3.0] oct-5-yl methyl alcohols, their preparation and use as additives for oleaginous compositions. 4,069,023, Cl. 44-63.000.

Brower, Jerome S. Underwater cutting rod. 4,069,407, Cl. 219-70.000.

Brown, Andrew Graham: *See—*
Kelsey, Christopher George, 4,068,476, Cl. 60-671.000.

Brown, Arthur W.; Goetz, Heinz E.; Morrow, Ronald J.; and Waldhauer, Charles H., Jr., to Honeywell Inc. Bus board connection apparatus. 4,068,910, Cl. 339-18.00P.

Brown, Charles Lester. Engine intake air moisturizer. 4,068,625, Cl. 123-25.00A.

Brown, Gerald V., to United States of America, National Aeronautics and Space Administration. Magnetic heat pumping. 4,069,028, Cl. 62-3.000.

Brown, Maurice H. Terminal forming and installing apparatus. 4,068,367, Cl. 29-564.600.

Browning, Bruce E., Jr.: *See—*
Gray, Edward L.; and Browning, Bruce E., Jr., 4,068,550, Cl. 83-471.200.

Brueske, Ralph H., to Butler Manufacturing Company. Moving work station for use in constructing a building roof. 4,068,446, Cl. 52-747.000.

Brugger, Richard D.: *See—*
Paavola, Oiva A.; and Brugger, Richard D., 4,068,654, Cl. 128-2.05N.

Brumat, Giorgio: *See—*
Vargiu, Silvio; Paparatto, Piero; Parodi, Antonio; and Brumat, Giorgio, 4,069,193, Cl. 260-40.00R.

Brummette, Craig: *See—*
Burleson, Finn, 4,068,877, Cl. 293-72.000.

Brummette, Winston P.: *See—*
Burleson, Finn, 4,068,877, Cl. 293-72.000.

Buchel, Arthur, to Interoptik Handelsanstalt. Apparatus for manufacturing tiles. 4,068,992, Cl. 425-91.000.

Buchovecky, Kalman E.; and Rearick, Milton R., to Aluminum Company of America. Method of pressing and forging metal powder. 4,069,042, Cl. 75-208.00R.

Buckley, Jere D.; Markle, David A.; Newell, William H.; and Offner, Abe, to Perkin-Elmer Corporation, The. Optical projection and scanning apparatus. 4,068,947, Cl. 355-72.000.

Buford, Wesley E. Torch. 4,068,833, Cl. 266-48.000.

Bullock, Michael Kermit; Clay, Sherwood Anderson; and Overton, Gregory Bingham, to International Business Machines Corporation. Sheet stacking apparatus. 4,068,839, Cl. 271-180.000.

Bunder Glas GmbH: *See—*
Hennings, Werner, 4,068,661, Cl. 128-215.000.

Bundy Corporation: *See—*
McNeill, Walter W., 4,068,971, Cl. 294-67.00R.

Bunker, Jack E. Tank fabrication apparatus. 4,068,359, Cl. 29-33.00K.

Burckhardt, Christoph Benedikt; Grandchamp, Pierre-Andre; and Hoffmann, Heinz, to Hoffmann-La Roche, Inc. Suppression of out-of-focus echoes in ultrasonic scanning. 4,069,467, Cl. 340-1.00R.

Burdick, Kenneth J.; Hand, Wilfred L.; Wheeler, Robert C.; and Wolfe, Paul G., to GTE Sylvania Incorporated. Automatic peaking control circuitry for a video processing system. 4,069,505, Cl. 358-162.000.

Bureau BBR Ltd.: *See—*
Brandestini, Antonio, 4,068,963, Cl. 403-268.000.

Burge, Theodor, to Sika AG, Vormals Kaspar Winkler & Co. Additive for mortar and concrete. 4,069,062, Cl. 106-93.000.

Burke Company, The: *See—*
Torbet, Philip A.; and Eager, Cyril Thomas, 4,068,879, Cl. 294-89.000.

Burkett, Jerry D., to Turbodyne Corporation (Gas Turbine Div.). Shaft turning parking bus for multiple unit installations utilizing a single motorized generator control system. 4,069,424, Cl. 307-87.000.

Burleson, Finn, to Brummette, Winston P.; and Brummette, Craig, part interest to each. Roller vehicle pushing bumper. 4,068,877, Cl. 293-72.000.

Burley, Richard K.: *See—*
Bourdon, Leo; Burley, Richard K.; and Kennedy, Clifford F., 4,068,653, Cl. 126-271.000.

Burnham, John W.: *See—*
Thorn, Donald J.; and Burnham, John W., 4,068,676, Cl. 137-13.000.

Burroughs Corporation: *See—*
Dixon, Charles Fulton, 4,068,792, Cl. 228-57.000.

Bush, Robert G., to L. D. Schreiber Cheese Company, Inc. Package and method of forming the same. 4,069,348, Cl. 426-119.000.

Bussmann, Egon: *See—*
De Steur, Hubert; Pernegger, Wolfgang; and Bussmann, Egon, 4,068,677, Cl. 137-93.000.

Butler, Farrell G., Jr. Fuel vaporizing method and apparatus. 4,068,638, Cl. 123-122.0AA.

Butler, Gene R.: *See—*
Butler, L. Dennis; Butler, Gene R.; Furtado, Anthony E.; Welker, Jerry W.; and Grey, Donald M., 4,068,804, Cl. 241-101.700.
Butler, L. Dennis; Butler, Gene R.; Furtado, Anthony E.; Welker, Jerry W.; and Grey, Donald M., to Sperry Rand Corporation. Method and machine for tearing apart stacked crop material bales. 4,068,804, Cl. 241-101.700.

Butler Manufacturing Company: *See—*
Brueske, Ralph H., 4,068,446, Cl. 52-747.000.

Butler, Walker; and Krahulec, Fred, to Motorola, Inc. Stabilized platform system. 4,068,538, Cl. 74-5.220.

Buysman, Petrus Johannes; Vermeulen, Gerardus Antonius Wilhelmus; and Bos, Cornelis Arie, to U.S. Philips Corporation. Apparatus for

forming apertures in a thin metal tape such as a shadow mask for a color television display tube. 4,069,085, Cl. 156-345.000.

Byxbe, Morley Ben; Meckley. Richard Allan; and Porter, William Hunt, to W. H. Porter, Inc. Panel roof construction with improved joints. 4,068,437, Cl. 52-464.000.

C.G.R. MeV: *See—*
Bensussan, Andre; and Levaillant, Claude, 4,069,456, Cl. 328-165.000.

C. Hager & Sons Hinge Manufacturing Company: *See—*
Peterson, Francis C., 4,068,507, Cl. 70-271.000.

C. R. Bard, Inc.: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,069,151, Cl. 128-214.00R.

Cadwallader, Robert H.; Darves-Bornoz, Yves; Gasparri, Angelo S.; and Racine, Francis A., to International Business Machines Corporation. Apparatus for the printing of ceramic green sheets. 4,068,994, Cl. 425-110.000.

California Institute of Technology: *See—*
Rembaum, Alan, 4,069,365, Cl. 428-262.000.

Call, Lyle G.: *See—*
Bell, Terry Lee; Call, Lyle G.; Dillan, George Omer; Jackson, James Phillip, Jr.; and Johnson, Larry Albin, 4,068,373, Cl. 29-741.000.

Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., to Upjohn Company, The. Novel benzamides. 4,069,224, Cl. 260-295.0AM.

Callecod, Robert L., to Recreation Systems Co. Child recreation structure. 4,068,842, Cl. 272-113.000.

Camardo, Gaspare. Wall bracing assembly and method. 4,068,427, Cl. 52-127.000.

Camp, Edward C.; Enos, Ellsworth C.; and Bombara, Dennis Michael, to Cincinnati Milacron-Heald Corporation. Grinding machine. 4,068,412, Cl. 51-5.00D.

Campbell, Joseph W.; and Siebert, Ralph, to Campbell, Joseph W.; Siebert, Ralph; and Highkin, Harry R. Automatic food plant production. 4,068,405, Cl. 47-65.000.

Canadian General Electric Company: *See—*
Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., 4,068,691, Cl. 141-284.000.

Canard, Pierre; and Levy, Albert, to Rhone-Poulenc Industries. Copolymers of butadiene and carboxylated styrene. 4,069,188, Cl. 260-29.70T.

Canfield, Michael P. Foamed plastic cooler and handle combination. 4,068,779, Cl. 220-94.00R.

Canon Kabushiki Kaisha: *See—*
Kasai, Masanao; Oikawa, Youko; Ito, Hiroshi; and Matsuno, Hiroshi, 4,069,487, Cl. 346-76.00L.
Ohta, Shinichi; Matsumura, Isao; Kobayashi, Kazunobu; and Madate, Haruhisa, 4,068,932, Cl. 351-7.000.
Yokota, Hideo, 4,068,929, Cl. 350-215.000.

Cantarutti, Armindo, to NRM Corporation. Tire curing press. 4,068,989, Cl. 425-38.000.

Cantor, Paul A.: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,069,151, Cl. 128-214.00R.

Carbonoyl Company: *See—*
Metzger, Grant W., 4,069,022, Cl. 44-51.000.

Carey, James E., to Shell Oil Company. Curable polyepoxide casting compositions. 4,069,202, Cl. 260-47.0EC.

Carey, James E.; and Reilly, Lawrence C., to Shell Oil Company. Rapid curing polyepoxide compositions. 4,069,203, Cl. 260-47.0EC.

Carl Hurth Maschinen- und Zahnradfabrik: *See—*
Loos, Herbert, 4,068,558, Cl. 90-1.60A.

Carlow, Earl F.; and Wiles, Michael F., to Motorola, Inc. Interrupt status register for interface adaptor chip. 4,069,510, Cl. 364-200.000.

Carlson, David Emil: *See—*
Pankove, Jacques Isaac; and Carlson, David Emil, 4,069,492, Cl. 357-17.000.

Carpenter, Robert J.; and Yee, Kenneth W., to United States of America, Commerce. High speed, wide dynamic range analog-to-digital conversion. 4,069,479, Cl. 340-347.0AD.

Carpenter Technology Corporation: *See—*
Ackermann, Friedrich W., 4,069,043, Cl. 75-232.000.

Carr, Russell L. K.: *See—*
Pattison, Victor A.; and Carr, Russell L. K., 4,069,340, Cl. 424-298.000.

Carrier Corporation: *See—*
Smith, Richard Seymour; and Hider, Philip Abraham, 4,068,391, Cl. 35-13.000.

Carrier, Vernon J. Caster support structure. 4,068,342, Cl. 16-21.000.

Carrieri, Louis F., to Gulf & Western Manufacturing Company. Cam actuated ejector mechanisms for presses. 4,068,520, Cl. 72-427.000.

Carrow, Guy E., to Phillips Petroleum Company. Apparatus for forming a thick-walled tubular product. 4,069,001, Cl. 425-467.000.

Casey, Donald James, to American Cyanamid Company. Chitin derived powder in sterile surgical element package. 4,068,757, Cl. 206-363.000.

Casey, William J., to AMF Incorporated. Nicotine removal process. 4,068,671, Cl. 131-143.000.

Cassatta, Joseph C.: *See—*
Dickie, Ray A.; and Cassatta, Joseph C., 4,069,364, Cl. 428-276.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Heinrich, Ernst; and Ribka, Joachim, 4,069,012, Cl. 8-41.00C.
Hett, Helmut; and Walser, Kurt, 4,069,013, Cl. 8-79.000.

Castle, George K.: *See—*
Billing, Rudolph W.; and Castle, George K., 4,069,075, Cl. 156-82.000.

Caterpillar Tractor Co.: *See—*
Boggs, Roger L., 4,068,698, Cl. 152-27.000.
Little, Joseph P., Jr., 4,068,642, Cl. 123-140.0MP.
Muellner, Donald R., 4,068,876, Cl. 293-69.00R.
Simmons, Gerald Paul; and Grooss, Frank August, 4,068,733, Cl. 180-77.00R.
Trayler, Robert J., 4,068,721, Cl. 172-1.000.

Caulier, Paul W., to General Electric Company. Hotbox detector. 4,068,811, Cl. 246-169.00A.

Cavitron Corporation: *See—*
Ross, Thaddeus C., 4,069,420, Cl. 250-341.000.

CCL Systems Limited: *See—*
Birks, Cedric Gwilliam, 4,068,962, Cl. 403-212.000.

Cecchi, Ronald L., to Dinamode Corporation, a part interest. Injection molding apparatus. 4,069,003, Cl. 425-568.000.

Cellucap Manufacturing Co.: *See—*
Wagenfeld, Gilbert B., 4,068,319, Cl. 2-197.000.

Central Glass Company, Limited: *See—*
Komatsu, Tadaaki; Takeda, Hirokazu; Oshio, Hideki; Matsuoka, Kimiaki; and Aramaki, Minoru, 4,069,266, Cl. 260-653.000.

Ceskoslovenska akademie ved: *See—*
Marek, Miroslav; Toman, Ludek; and Pecka, Jan, 4,069,124, Cl. 204-159.240.
Marek, Miroslav; Toman, Ludek; and Pecka, Jan, 4,069,125, Cl. 204-159.240.

Chachin, Viktor Nikolaevich; Sharin, Jury Efimovich; Zdor, Gennady Nikolaevich; Shaduya, Vladimir Leontievich; and Zhuravsky, Alexandr Julyanovich. Device for electrohydraulic die-forging. 4,068,514, Cl. 72-56.000.

Chagunava, Raul Vladimirovich: *See—*
Dzhaparidze, Levan Nikolaevich; Chakhunashvili, Temuri Alexandrovich; Mainsuradze, Venera Romanovna; Chagunava, Raul Vladimirovich; Kervalishvili, Zurab Yasonovich; Sikharulidze, Nodar Georgievich; Otiashvili, Dali Georgievna; Dubov, Yauzhe Markovich; Bogdanov, Eduard Alimovich; Gogoladze, Georgy Trofimovich; Teisheva, Alla Abelevna; Ryzygraeva, Galina Nikolaevna; Melnikov-Eikhenvald, Mikhail Alexeevich; and Rokva, Temuri Valeryanovich, 4,069,116, Cl. 204-96.000.

Chakhunashvili, Temuri Alexandrovich: *See—*
Dzhaparidze, Levan Nikolaevich; Chakhunashvili, Temuri Alexandrovich; Mainsuradze, Venera Romanovna; Chagunava, Raul Vladimirovich; Kervalishvili, Zurab Yasonovich; Sikharulidze, Nodar Georgievich; Otiashvili, Dali Georgievna; Dubov, Yauzhe Markovich; Bogdanov, Eduard Alimovich; Gogoladze, Georgy Trofimovich; Teisheva, Alla Abelevna; Ryzygraeva, Galina Nikolaevna; Melnikov-Eikhenvald, Mikhail Alexeevich; and Rokva, Temuri Valeryanovich, 4,069,116, Cl. 204-96.000.

Chalmers, David Calder, to Polysar Limited. Halogenated polyacrylate elastomers. 4,069,180, Cl. 260-23.0AR.

Champion Products Inc.: *See—*
Yellen, Richard C.; and Morrell, Edward A., 4,068,314, Cl. 2-94.000.

Chan, Bock G.: *See—*
Stanley, William L.; Watters, Glenn G.; and Chan, Bock G., 4,069,106, Cl. 195-68.000.

Chan, Thomas S.: *See—*
Johanson, Donald L.; and Chan, Thomas S., 4,069,400, Cl. 179-107.00E.

Chapman, Alan Stanley John: *See—*
Barrett, Bruce Robert; and Chapman, Alan Stanley John, 4,069,399, Cl. 179-15.0AL.

Charchian, Loris Joseph; and Heidenreich, David Charles, to Dana Corporation. Shaft mounted standby drive clutch. 4,068,748, Cl. 192-41.00A.

Chard, William C.: *See—*
Cooke, Claude E., Jr.; Hedden, Walter A.; and Chard, William C., 4,068,718, Cl. 166-280.000.

Charles Offset Company, Inc.: *See—*
Bortner, Allen A., 4,068,835, Cl. 270-53.000.

Charles S. Madan & Company Limited: *See—*
Balme, Roy; and Perkins, John Francis, 4,068,983, Cl. 417-401.000.

Chatwin, Maurice Stephen; and Porter, George Zell, to Boeing Company, The. Vehicle tie-down method and apparatus. 4,068,813, Cl. 248-119.00R.

Chayer, Brigitte S., to Laliberte, Robert. Adjustable pants. 4,068,321, Cl. 2-227.000.

Chemetron Corporation: *See—*
Abrams, Edward; and Masella, Anthony J., 4,069,147, Cl. 210-6.000.

Chemisches Laboratorium Fritz-Walter Lange GmbH & Co KG: *See—*
Lange, Fritz-Walter; Jacobi, Haireddin; and Muller, Jens, 4,069,336, Cl. 424-274.000.

Chevron Research Company: *See—*
Hodgson, Clive, 4,069,299, Cl. 423-462.000.
Komoto, Robert G., 4,069,273, Cl. 260-683.15D.
Toland, William G., 4,068,481, Cl. 61-45.00B.
Unverferth, Jack W., 4,069,133, Cl. 208-11.00R.

Chia, Enrique Calixto: *See—*
Cofer, Daniel B.; and Chia, Enrique Calixto, 4,068,705, Cl. 164-270.000.

Chisso Corporation: *See—*
Inukai, Takashi; Sato, Hideo; and Ishibe, Tetsuya, 4,069,167, Cl. 252-299.000.

Chivers, Thomas R., to Southern Tool Mfg. Co., Inc. Fully concealed door hinge. 4,068,348, Cl. 16-129.000.

Chorosevic, Jerome J.: *See—*
Green, Bernard J.; and Chorosevic, Jerome J., 4,068,532, Cl. 73-462.000.

Christopherson, Dennis C.: *See—*
Allison, Arthur F.; Christopherson, Dennis C.; Mays, Byron L.; and Reed, Reginald A., 4,068,567, Cl. 93-93.00C.

Ciaudelli, Joseph P.; and Karg, Gerhart, to Avon Products, Inc. Cationic skin substantive sunscreen composition and method. 4,069,309, Cl. 424-47.000.

Ciba-Geigy AG: *See—*
Randell, Donald Richard; and Pickles, Wilfred, 4,069,189, Cl. 260-30.60R.

Ciba-Geigy Corporation: *See—*
Hegar, Gert, 4,069,218, Cl. 260-153.000.
Karrer, Friedrich, 4,069,344, Cl. 424-324.000.
Mueller, Karl Friedrich, 4,069,244, Cl. 260-501.120.
Ramey, Chester E.; and Luzzi, John J., 4,069,196, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,069,199, Cl. 260-45.75C.
Rosenberger, Siegfried; and Schmidt, Andreas, 4,069,197, Cl. 260-45.8NE.
Spivack, John D., 4,069,200, Cl. 260-45.85S.
Wiederkehr, Rene; and Bickel, Hans, 4,069,324, Cl. 424-246.000.

Cincinnati Milacron-Heald Corporation: *See—*
Camp, Edward C.; Enos, Ellsworth C.; and Bombara, Dennis Michael, 4,068,412, Cl. 51-5.00D.

Cincinnati Milacron Inc.: *See—*
Stackhouse, Theodore Hahn, 4,068,536, Cl. 74-417.000.

Cipris, Divna; and Pouli, Dirk, to Allied Chemical Corporation. Process for preparing organic disulfides. 4,069,259, Cl. 260-608.000.

Clampitt, Richard L.; and Hessert, James E., to Phillips Petroleum Company. Method for acidizing subterranean formations. 4,068,719, Cl. 166-282.000.

Clark Equipment Company: *See—*
Wolfe, Robert W., 4,068,537, Cl. 74-477.000.

Clay, Sherwood Anderson: *See—*
Bullock, Michael Kermit; Clay, Sherwood Anderson; and Overton, Gregory Bingham, 4,068,839, Cl. 271-180.000.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,068,814, Cl. 248-176.000.

Clorley, Paul Grahame: *See—*
Crossley, John Alan; Hacker nee Weimer, Valerie Kathryn; and Clorley, Paul Grahame, 4,069,113, Cl. 204-43.00G.

CMI Corporation: *See—*
Rowe, Murray A., 4,068,970, Cl. 404-120.000.

Cofer, Daniel B.; and Chia, Enrique Calixto, to Southwire Company. Forming apparatus with roller guide tube. 4,068,705, Cl. 164-270.000.

Coin Acceptors, Inc.: *See—*
Martin, Bart G., 4,068,752, Cl. 194-1.00H.

Colgate Palmolive Company: *See—*
Harrison, Michael, 4,069,310, Cl. 424-49.000.
Mannara, Giuseppe, 4,069,311, Cl. 424-49.000.
Mannara, Giuseppe, 4,069,312, Cl. 424-49.000.

Coller, James Ray, to AMP Incorporated. Tool for removing and installing connector. 4,068,374, Cl. 29-747.000.

Collins, William J. Device and method for obtaining one or more samples of liquid. 4,068,530, Cl. 73-425.40R.

Collins, William J. Molten metal sampler. 4,068,531, Cl. 73-425.40R.

Colt Industries Operating Corporation: *See—*
Newport, Samuel O., 4,068,644, Cl. 123-185.0BA.

Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D.; and Behnke, Edward R., 4,068,467, Cl. 59-93.000.

Comalco Aluminium (Bell Bay) Limited: *See—*
Jenkinson, David Charles, 4,068,645, Cl. 123-193.00C.

Combustion Engineering, Inc.: *See—*
Fernandes, John Henry, 4,069,024, Cl. 48-197.00R.
Palmer, David Nelson, 4,069,083, Cl. 156-329.000.

Commissariat a l'Energie Atomique: *See—*
Bourdel, Jacques, 4,069,421, Cl. 250-363.00S.

Compagnie Francaise de Raffinage: *See—*
Aboulafia, Joseph; Le Fustec, Richard; and Schranz, Claude, 4,069,287, Cl. 264-140.000.

Compagnie Francaise des Petroles: *See—*
Jegousse, Michel J., 4,068,490, Cl. 61-108.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,068,491, Cl. 61-110.000.

Compagnie General d'Electricite: *See—*
Farcy, Jean-Claude; Girard, Genevieve; and Michon, Maurice, 4,069,458, Cl. 330-4.300.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (DORIS): *See—*
Jegousse, Michel J., 4,068,490, Cl. 61-108.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,068,491, Cl. 61-110.000.

Compagnie Maritime d'Expertises: *See—*
Jegousse, Michel J., 4,068,490, Cl. 61-108.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,068,491, Cl. 61-110.000.

Concept Marketing, Inc.: *See—*
Moore, Larry D.; Johnson, Isaiah W.; and Thompson, Charley L., Jr., 4,068,668, Cl. 128-330.000.

Consolidated Packaging Corporation: *See—*
Kullman, Thomas D., Jr., 4,068,796, Cl. 229-49.000.

Container Corporation of America: *See—*
Gardner, Jeffrey M., 4,068,793, Cl. 229-14.00C.

Continental Group, Inc., The: *See—*
Shaw, Fred B., 4,069,349, Cl. 426-395.000.

Continental M.D.M., Inc.: *See—*
Jarman, David J., 4,068,753, Cl. 198-373.000.

Continental Oil Company: *See—*
Wong, Soon Y., 4,069,119, Cl. 204-106.000.

Control Components, Inc.: *See—*
Self, Richard E., 4,068,683, Cl. 137-625.300.

Control Electronics Co., Inc.: *See—*
Goldstein, Harold, 4,068,526, Cl. 73-362.0AR.

Control Products Inc.: *See—*
Dacal, Perfecto, 4,069,415, Cl. 362-263.000.

Conway, Arch W.; and Urdaneta, Nelson, to Dana Laboratories, Inc. Apparatus for automatically detecting values of periodically time varying signals. 4,069,452, Cl. 324-103.00P.

Cook, Earl Charles. Automobile engine economizer. 4,068,639, Cl. 123-127.000.

Cooke, Claude E., Jr.; Hedden, Walter A.; and Chard, William C., to Exxon Production Research Company. Hydraulic fracturing method using sintered bauxite propping agent. 4,068,718, Cl. 166-280.000.

Cooley, Denton A.: *See—*
Sharp, Russell G.; Reed, Charles C.; and Cooley, Denton A., 4,068,664, Cl. 128-276.000.

Cooper, Hal B. H. Process for removing and recovering acidic gases from gaseous mixtures containing them. 4,069,117, Cl. 204-98.000.

Cooper, Martin H., to Westinghouse Electric Corporation. Adsorption seal for nuclear reactors. 4,069,100, Cl. 176-37.000.

Cornacchio, Americo: *See—*
Lodato, Alphonso; Cornacchio, Americo; and Fox, Edward M., 4,068,911, Cl. 339-90.00R.

Corning Glass Works: *See—*
Sullivan, Kevin J., 4,069,185, Cl. 260-29.6HN.

Cosentino, Louis C.; and Fischbach, LeRoy J., to Renal Systems, Inc. Ultrasonic air and blood foam detector. 4,068,521, Cl. 73-19.000.

Cosgrove, Allan Hugh: *See—*
Whitney, John Kimball; Cosgrove, Allan Hugh; and Flick, Roland Edward, 4,068,870, Cl. 285-320.000.

Costa, John. Hand tool for manipulating coil springs. 4,068,363, Cl. 29-227.000.

Cottam, Spencer D., to Midcon Pipeline Equipment Co. Pipe wrapping apparatus. 4,069,088, Cl. 156-392.000.

Coupry, Jean: *See—*
Develay, Roger; and Coupry, Jean, 4,069,072, Cl. 148-32.000.

Couture, Paul A.: *See—*
Anghinetti, Joseph R.; and Couture, Paul A., 4,068,417, Cl. 52-1.000.

Cox, Gary L.: *See—*
Johnson, Bennie R.; and Cox, Gary L., 4,068,347, Cl. 16-112.000.

Cox of Watford Limited: *See—*
Babbs, Frederick William, 4,068,887, Cl. 297-216.000.

Cox, Robert B.: *See—*
Martin, Thomas B.; Herscher, Marvin B.; and Cox, Robert B., 4,069,393, Cl. 179-1.0SD.

Craft, Donald Irving: *See—*
Borman, Willem Frederik Hendrik; Craft, Donald Irving; and Kramer, Mortor, 4,069,278, Cl. 260-860.000.

Craighead, James W. Money buckle. 4,068,787, Cl. 224-26.00E.

Cramp, Harry Donald: *See—*
Easy, Maurice Henry; Cramp, Harry Donald; Hartley, Peter Lambert; and Williams, Philip David Lane, 4,069,481, Cl. 343-6.0TV.

CraneVeyor Corporation: *See—*
Lichti, Robert D., 4,068,965, Cl. 403-313.000.

Cremona, Angelo. Traversing device for wood shearing machine. 4,068,693, Cl. 144-178.000.

Crivello, James V., to General Electric Company. Photocurable epoxy compositions containing group Va onium salts. 4,069,055, Cl. 96-115.00R.

Crivello, James V., to General Electric Company. Photopolymerizable composition containing group Va aromatic onium salts. 4,069,056, Cl. 96-115.00P.

Crooks, Fuller A., to Selzer, Elmer A. Pneumatic motor with muffled exhaust. 4,068,987, Cl. 418-181.000.

Crossley, John Alan; Hacker nee Weimer, Valerie Kathryn; and Clorley, Paul Grahame, to Oxy Metal Industries Corporation. Electroplating gold alloys and electrolytes therefor. 4,069,113, Cl. 204-43.00G.

Crowell, James E. Tamping tool. 4,068,594, Cl. 104-10.000.

Cunningham, Allen B.; and Miller, Edward T., to Exxon Production Research Company. Use of periodic signals for continuous wave seismic prospecting. 4,069,470, Cl. 340-15.5TA.

Cunningham, Cecil R. Cooking oil cleaner and filter system for deep fat fryers. 4,068,571, Cl. 99-408.000.

Curtis, Glenn Howard: *See—*
Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,068,356, Cl. 26-91.000.

Cushing, Donald S., to General Electric Company. Full-time flood protection control for dishwasher. 4,069,425, Cl. 134-57.00D.

Cutler-Hammer, Inc.: *See—*
Allison, Arthur F.; Christopherson, Dennis C.; Mays, Byron L.; and Reed, Reginald A., 4,068,567, Cl. 93-93.00C.

Czorniak, Edward S., to Permacrete Products Corporation. Modular mausoleum. 4,068,425, Cl. 52-136.000.

Dacal, Perfecto, to Control Products Inc. High intensity discharge lamp

for use in explosive atmospheres such as mines. 4,069,415, Cl. 362-263.000.

Dacey, Raymond Gwilym; and Verity, Richard Hugh, to Baker Perkins Holdings Limited. Apparatus for moulding confectionery. 4,068,993, Cl. 425-104.000.

Dacor Corporation: *See—*
Kobzan, John, 4,068,657, Cl. 128-142.00R.

Dahlstrom, Reuben O. Machine for rolling newspaper into logs. 4,068,564, Cl. 93-1.00C.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Toida, Takashi, 4,068,923, Cl. 350-160.0LC.

Daicel Ltd.: *See—*
Yokota, Hiromu; Namikoshi, Hajime; Watanabe, Masataka; Kato, Kunio; and Ohnishi, Akio, 4,068,670, Cl. 131-2.000.

Daimer, Wolfgang, to Vianova Kunstharz, A.G. Aqueous stoving coating composition comprising N-oxide structures containing polyhydroxy components. 4,069,183, Cl. 260-29.300.

Dale (Massfield) Limited: *See—*
Dring, Eric, 4,068,894, Cl. 299-45.000.

D'Alessandro, Alfred C., to Aid Pak, Inc. Container. 4,068,663, Cl. 128-232.000.

Dalrymple, Ronald Howell: *See—*
Ingle, Donald Lee; and Dalrymple, Ronald Howell, 4,069,339, Cl. 424-279.000.

Dana Corporation: *See—*
Charchian, Loris Joseph; and Heidenreich, David Charles, 4,068,748, Cl. 192-41.00A.

Dana Laboratories, Inc.: *See—*
Conway, Arch W.; and Urdaneta, Nelson, 4,069,452, Cl. 324-103.00P.

Danneberg, Peter: *See—*
Langbein, Adolf; Danneberg, Peter; and Kuhn, Franz Josef, 4,069,331, Cl. 424-267.000.

Dappen, Glen Marshall: *See—*
Wu, Tai-Wing; and Dappen, Glen Marshall, 4,069,017, Cl. 23-230.00B.

Darves-Bornoz, Yves: *See—*
Cadwallader, Robert H.; Darves-Bornoz, Yves; Gasparri, Angelo S.; and Racine, Francis A., 4,068,994, Cl. 425-110.000.

Das, Gobinda: *See—*
Beyer, Klaus D.; Das, Gobinda; Poponiak, Michael R.; and Yeh, Tsu-Hsing, 4,069,068, Cl. 148-1.500.

Dasher, Wayne G., to Gilbert & Bennett Mfg. Co., The. Box spring grid and method of manufacture. 4,068,331, Cl. 5-267.000.

Da Silva, Edouard, to Instruments S.A. Monochromator having a concave holographic grating. 4,068,954, Cl. 356-100.000.

Data General Corporation: *See—*
Dunn, David, 4,069,462, Cl. 331-11.000.

Davis, Donald A., to Schwamb Corporation, The. Movable partition wall. 4,068,432, Cl. 52-205.000.

Davis, Irwin J.: *See—*
Skoultchi, Martin M.; and Davis, Irwin J., 4,069,123, Cl. 204-159.180.

Dawson, Charles W., to General Electric Company. Blown tube collapse frame assembly. 4,068,999, Cl. 425-392.000.

Day, Stephen W.; and Hutcheson, Daniel M. Composite wall panel assembly and method of production. 4,068,434, Cl. 52-220.000.

Dayco Corporation: *See—*
Bollmer, Jacob A., 4,068,587, Cl. 101-415.100.
Sanna, Waldo A.; and Sand, Carl A., 4,068,394, Cl. 35-50.000.

De luxe General, Incorporated: *See—*
Gyori, Robert Paul, 4,068,943, Cl. 355-38.000.

Dean, Raymond H.; and Roberts, Michael M., to Tempmaster Corporation. Method and device for reducing noise. 4,068,736, Cl. 181-224.000.

DeBard, James Edward; Borden, Raymond Walter; and Tumpey, John Joseph, to Bendix Corporation, The. Closure for semiconductor device and method of construction. 4,068,368, Cl. 29-588.000.

Decca Ltd.: *See—*
Easy, Maurice Henry; Cramp, Harry Donald; Hartley, Peter Lambert; and Williams, Philip David Lane, 4,069,481, Cl. 343-6.0TV.

Deciduous Fruit Board, The: *See—*
Lawrence, Bryan, 4,068,794, Cl. 229-23.00R.

Decoppet, Jean-Pierre, to General Dynamics Corporation. Inside scaffolding for large metallic structures and method of using same. 4,068,419, Cl. 52-40.000.

Deem, Brian Charles; and Karon, Marc Alan, to Bendix Corporation, The. Adaptive braking modulator with electrically activated relay valve. 4,068,902, Cl. 303-28.000.

Deering, Roland F., to Union Oil Company of California. Oil shale retorting process with desulfurization of flue gas. 4,069,132, Cl. 208-11.00R.

Defranould, Philippe; and Desbois, Jean, to Thomson-CSF. Device for the two-dimensional reading of optical images, using elastic surface waves. 4,069,507, Cl. 358-213.000.

Delligatti, Patrick. Sequence numbering code marking device. 4,068,578, Cl. 101-35.000.

De Luca, Paul V., to Porta Systems Corporation. Three element gas tube protector module. 4,069,509, Cl. 361-124.000.

DeMarco, JoAnn, to Loctite Corporation. Self-emulsifying anaerobic composition. 4,069,378, Cl. 526-328.000.

Demaret, Pierre E. Device for mounting cantilever-suspended booms on agricultural vehicles for distributing treatment materials. 4,068,812, Cl. 248-14.000.

DeMarinis, Robert Michael, to SmithKline Corporation. Preparation of trifluoromethylthioacetic acid and its esters. 4,069,243, Cl. 560-153.000.

DeMarse, Ernest W.; and Gozdiff, Michael M., to Goodyear Tire & Rubber Company, The. Means and method of separating lengths of flattened flexible polymeric tube. 4,069,359, Cl. 428-36.000.

Dermy, Rene M.: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., . 4,068,491, Cl. 61-110.000.

Desbois, Jean: *See—*
Defranould, Philippe; and Desbois, Jean, 4,069,507, Cl. 358-213.000.

Deschler, Kathleen E. Inflatable bathtub. 4,068,326, Cl. 4-150.000.

Descoteaux, Claude; and Wenzel, Chester. Vertical lift assembly. 4,068,534, Cl. 74-27.000.

Deseret Pharmaceutical Co., Inc.: *See—*
Beck, Richard William, 4,068,660, Cl. 128-214.400.
Moorehead, Harvey Robert, 4,068,659, Cl. 128-214.400.

De Steur, Hubert; Pernegger, Wolfgang; and Bussmann, Egon, to Siemens Aktiengesellschaft. Process control circuit for metal-depositing baths. 4,068,677, Cl. 137-93.000.

Detectors, Inc.: *See—*
Rubey, Ulyss Ray, 4,068,613, Cl. 116-114.0AH.

Detroit, William John; and Sanford, Michael Elliot, to American Can Company. Solubilized lignosulfonate derivatives. 4,069,217, Cl. 260-124.00R.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Mannsfeld, Sven Peter; Pfeiffer, Arno; Tanner, Herbert; Wagner, Hans; and Liebetanz, Erich, deceased, 4,069,251, Cl. 260-534.00S.

Develay, Roger; and Coupry, Jean, to Pechiney Ugine Kuhlmann. Aluminum alloy. 4,069,072, Cl. 148-32.000.

Deyak, Frank L.; and Wegwerth, Arthur A., to Minnesota Mining and Manufacturing Company. Workable and curable epoxy-terminated silane films. 4,069,368, Cl. 428-447.000.

Dezawa, Shin-ichiro; Sasazawa, Koji; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process for producing ferromagnetic powder. 4,069,164, Cl. 252-62.620.

Diamond Shamrock Corporation: *See—*
Magee, Thomas A., 4,069,342, Cl. 424-304.000.

Dickie, Ray A.; and Cassatta, Joseph C., to Ford Motor Company. Radiation polymerized coated article and method of making same. 4,069,364, Cl. 428-276.000.

Difley, Charles R.; Johnson, Milton J.; and McDonald, William R., to Whirlpool Corporation. Refuse compactor with selective spray device. 4,068,575, Cl. 100-45.000.

Dillan, George Omer: *See—*
Bell, Terry Lee; Call, Lyle G.; Dillan, George Omer; Jackson, James Phillip, Jr.; and Johnson, Larry Albin, 4,068,373, Cl. 29-741.000.

Dimitroff, Boris. Apparatus and process for steam generation by solar energy. 4,068,474, Cl. 60-641.000.

Dimopoulos, George H., to Michael Business Machines Corporation. Manual paper collator. 4,068,836, Cl. 270-58.000.

Dinamode Corporation: *See—*
Cecchi, Ronald L., 4,069,003, Cl. 425-568.000.

Dirks, Arthur A.: *See—*
Meyers, William G.; and Dirks, Arthur A., 4,068,860, Cl. 280-432.000.

DiSalvo, Gail D.; and Berard, Raymond A., to Acushnet Company. Solid golf ball. 4,068,849, Cl. 273-218.000.

Dittberner, Wolfgang: *See—*
Nolte, Gert; and Dittberner, Wolfgang, 4,068,899, Cl. 303-6.00A.

Dittman, Melvin M. Combined fuel tank protective cover and thigh grip pad for motorcycles. 4,068,859, Cl. 280-289.00E.

Dix, James S.: *See—*
Mathis, Ronald D.; and Dix, James S., 4,069,277, Cl. 260-857.0PG.

Dixon, Charles Fulton, to Burroughs Corporation. Device for protecting the edge connectors of printed circuit boards during wave soldering. 4,068,792, Cl. 228-57.000.

Dmitrievich, Loschilin Evghenii: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, 4,068,685, Cl. 139-188.00R.

Dockerill, Ian Anthony, to Lucas Industries Limited. Method of manufacturing an extruded steel component. 4,068,518, Cl. 72-354.000.

Doerfler, Roger E.; and Willi, Gary A., to Kelsey-Hayes Co. Blend back proportioning brake control apparatus. 4,068,900, Cl. 303-6.00C.

Dofek, Ladislav: *See—*
Dressler, Mirko; and Dofek, Ladislav, 4,068,881, Cl. 294-111.000.

Doherty, John, Jr., to Texas Instruments Incorporated. Thermally responsive valve assembly. 4,068,800, Cl. 236-101.00C.

Doi, Toshitada; and Wakabayashi, Hitoshi, to Sony Corporation. Stereophonic sound reproduction system. 4,069,394, Cl. 179-1.00G.

Donahue, Edward T.: *See—*
Kenney, Harold E.; and Donahue, Edward T., 4,069,163, Cl. 252-46.700.

Dopyera, John. Stringed musical instrument. 4,068,553, Cl. 84-296.000.

Dorland, Herman: *See—*
Tharp, Gordon H.; and Dorland, Herman, 4,068,364, Cl. 29-235.000.

Dorman Smith Traffic Products Limited: *See—*
Minoprio, William Edward; and Horsfield, Arthur Kenneth, 4,069,404, Cl. 200-60.000.

Dorr, Hans-Werner: *See—*
Grosse, Ludwig; and Dorr, Hans-Werner, 4,069,082, Cl. 156-281.000.

Dorschner, Kenneth P.; and Albright, James A., to SCM Corporation.

N-haloacyl 4-spirocycloaliphatic oxazolidines. 4,069,036, Cl. 71-88.000.

Dotsko, Martin, to Singer Company, The. Front projection screen. 4,068,922, Cl. 350-126.000.

Douglass, Edward T., Jr. Dust seal for rotatable shaft passing through a bin wall. 4,068,854, Cl. 277-237.00A.

Dow Chemical Company, The: *See—*
Gurgiolo, Arthur E., 4,069,242, Cl. 560-93.000.
McCarty, Leslie P., 4,069,346, Cl. 424-350.000.
Pierce, James K., 4,069,341, Cl. 424-302.000.

Dow Corning Corporation: *See—*
Mikami, Ryuzo; and Hanada, Tsuneo, 4,069,178, Cl. 260-22.00S.

Downing, Terry R.; and Herwig, Warren E., to Allis-Chalmers Corporation. Lift vehicle with fail-safe overload protective system. 4,068,773, Cl. 214-674.000.

Draber, Wilfried: *See—*
Findeisen, Kurt; Draber, Wilfried; and Schwarz, Herbert, 4,069,252, Cl. 260-545.00R.

Draper, Homer L.: *See—*
Gagle, Duane W.; and Draper, Homer L., 4,068,968, Cl. 404-7.000.

Dressler, Mirko; and Dofek, Ladislav, to Vyzkumny ustav lesniho hospodarstvi a myslivosti. Arrangement for automatic regulation of the cable length of a holding cable of grab means. 4,068,881, Cl. 294-111.000.

Dressler, Wolfgang: *See—*
Schraud, Alfred; and Dressler, Wolfgang, 4,068,709, Cl. 165-95.000.

Dring, Eric, to Dale (Massfield) Limited. Mining machine cowl assembly. 4,068,894, Cl. 299-45.000.

Driscoll, James R. Table assembly of molded plastics material. 4,068,600, Cl. 108-111.000.

Drower, Herbert M.; and Rhyner, Edison L., to Sealtran Corporation. Method for protective film lamination with curl control. 4,069,081, Cl. 156-272.000.

Dubois, Jean Claude; Gazard, Maryse; Duchesne, Claude; and Lavenu, Jean Claude, to Thomson-CSF. Method of manufacturing an electron-sensitive resin, and an application of said resin to integrated optics. 4,068,919, Cl. 350-96.0WG.

Dubov, Yauzhe Markovich: *See—*
Dzhaparidze, Levan Nikolaevich; Chakhunashvili, Temuri Alexandrovich; Mainsuradze, Venera Romanovna; Chagunava, Raul Vladimirovich; Kervalishvili, Zurab Yasonovich; Sikharulidze, Nodar Georgievich; Otiashvili, Dali Georgievna; Dubov, Yauzhe Markovich; Bogdanov, Eduard Alimovich; Gogoladze, Georgy Trofimovich; Teisheva, Alla Abelevna; Ryzygraeva, Galina Nikolaevna; Melnikov-Eikhenvald, Mikhail Alexeevich; and Rokva, Temuri Valeryanovich, 4,069,116, Cl. 204-96.000.

Duchesne, Claude: *See—*
Dubois, Jean Claude; Gazard, Maryse; Duchesne, Claude; and Lavenu, Jean Claude, 4,068,919, Cl. 350-96.0WG.

Duckworth, Charles England. Internal combustion engine with designated exhaust burning cylinders. 4,068,628, Cl. 123-59.0EC.

Duff, Donald R.; Lamb, James O.; and Pezzolo, Donald E., to Fairchild Camera and Instrument Corporation. Frequency adjustment circuit. 4,068,462, Cl. 58-23.0AC.

Duimstra, Dwight L.: *See—*
Fanning, Larry J.; and Duimstra, Dwight L., 4,068,827, Cl. 254-139.100.

Dunlop, Andrew P., to Quaker Oats Company, The. Apparatus for catalytic gassing in the manufacture of foundry cores and molds. 4,068,703, Cl. 164-160.000.

Dunn, David, to Data General Corporation. Phase-locked loops. 4,069,462, Cl. 331-11.000.

Du Pont de Nemours, E. I., and Company: *See—*
Evans, Arlyn Wayne, 4,069,037, Cl. 71-93.000.
Evans, Robert F., 4,068,915, Cl. 339-176.0MP.
Fickes, Michael Glenn, 4,069,076, Cl. 156-83.000.
Gray, Joseph B., 4,068,830, Cl. 366-174.000.
Hayek, Mason, 4,069,159, Cl. 252-8.800.
Hoeschele, Guenther Kurt, 4,069,208, Cl. 260-75.0NH.
Hoover, Fred Wayne; and Roberts, Robert Earl, 4,069,157, Cl. 210-433.00M.
Hutton, David Glenn; and Robertaccio, Francis Leonard, 4,069,148, Cl. 210-11.000.
Johnson, Alexander Lawrence, 4,069,035, Cl. 71-76.000.
Kumar, Vijayendra, 4,069,361, Cl. 428-95.000.
Kunz, Robert Allison, 4,069,262, Cl. 260-646.000.
Mahler, Walter, 4,068,706, Cl. 165-1.000.
Manos, Philip, 4,068,387, Cl. 34-9.000.
Marder, Milton David; Osmalov, Robert; and Pfeiffer, Gerald P., 4,069,078, Cl. 156-181.000.
Murphy, Charles Vincent, 4,069,122, Cl. 204-158.0HE.
Prichard, William W.; and Stacey, Francis Wilfred, 4,069,320, Cl. 424-226.000.
Rohde, Vernon Carl, 4,068,798, Cl. 233-26.000.
Sandy, Charles Anthony, 4,069,237, Cl. 260-437.00R.
Segraves, William Benjamin; and Mulholland, Kenneth Lee, 4,069,363, Cl. 428-224.000.

Dur, Werner; and Forster, Rene, to Hydrel A.G. System for securing guide rails in machine stand. 4,068,906, Cl. 308-3.00A.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pharmacologically active thiourea and urea compounds as inhibitors of H-2 histamine receptors. 4,069,327, Cl. 424-250.000.

Durham Industries, Inc.: *See—*
Weiser, Hal, 4,068,403, Cl. 46-241.000.

Dursch, Walter; Kleiner, Hans-Jerg; and Thamm, Horst-Dieter, to Hoechst Aktiengesellschaft. Preparation of phosphonic and/or phosphinic acids. 4,069,245, Cl. 260-502.40R.

Duwel, Dieter: *See—*
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,069,325, Cl. 424-246.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Richtzenhain, Hermann; and Stephan, Rudolf, 4,069,265, Cl. 260-652.50R.

Dzhaparidze, Levan Nikolaevich; Chakhunashvili, Temuri Alexandrovich; Mainsuradze, Venera Romanovna; Chagunava, Raul Vladimirovich; Kervalishvili, Zurab Yasonovich; Sikharulidze, Nodar Georgievich; Otiashvili, Dali Georgievna; Dubov, Yauzhe Markovich; Bogdanov, Eduard Alimovich; Gogoladze, Georgy Trofimovich; Teisheva, Alla Abelevna; Ryzygraeva, Galina Nikolaevna; Melnikov-Eikhenvald, Mikhail Alexeevich; and Rokva, Temuri Valeryanovich. Electrochemical process for producing manganese dioxide. 4,069,116, Cl. 204-96.000.

Dziedzic, Chester John, to GTE Sylvania Incorporated. Matrix structure and method for making. 4,068,707, Cl. 165-8.000.

E M I Limited: *See—*
Hounsfield, Godfrey Newbold, 4,069,422, Cl. 250-445.00T.

Eaby, Daniel G.: *See—*
Townley, Charles O.; Vegell, Allan; and Eaby, Daniel G., 4,068,324, Cl. 3-1.913.

Eager, Cyril Thomas: *See—*
Torbet, Philip A.; and Eager, Cyril Thomas, 4,068,879, Cl. 294-89.000.

Easter, William M., to Horix Manufacturing Company. Container capping machine. 4,068,450, Cl. 53-331.500.

Eastman Kodak Company: *See—*
Irick, Gether, Jr.; and Kelly, Charles A., 4,069,227, Cl. 260-308.00R.
Wu, Tai-Wing, 4,069,016, Cl. 23-230.00B.
Wu, Tai-Wing; and Dappen, Glen Marshall, 4,069,017, Cl. 23-230.00B.

Easy, Maurice Henry; Cramp, Harry Donald; Hartley, Peter Lambert; and Williams, Philip David Lane, to Decca Ltd. Pulse radar apparatus. 4,069,481, Cl. 343-6.0TV.

Eaton, David Crawford; Nicholson, Benjamin Eric; and Williams, Barry, to Imperial Chemical Industries Limited. Triazine compositions. 4,069,380, Cl. 544-212.000.

Ebeling, Wilfried; and Schulte, Klaus, to Bayer Aktiengesellschaft. Apparatus for the production of foam materials containing a filler material. 4,068,831, Cl. 366-156.000.

Eberhardt, Helmut: *See—*
Friesenborg, Bernd; and Eberhardt, Helmut, 4,069,143, Cl. 209-10.000.

Ebner, John Steven; Pizzeri, Francis Charles; and Sprecher, Charles Grimes, III, to Milgo Electronic Corporation. Swivel joint. 4,068,961, Cl. 403-55.000.

Ecodyne Corporation: *See—*
Mason, Donald G., 4,069,156, Cl. 210-195.00S.

Ecological Systems, Inc.: *See—*
Salemi, Jerry S.; and Pease, Paul Dean, 4,069,127, Cl. 204-229.000.

Edenwall, Ingvar A. O.: *See—*
Gorling, Karl Goran; Edenwall, Ingvar A. O.; Jansson, Jan-Olof; and Mioen, Thomas K., 4,069,041, Cl. 75-101.00R.

Edling, Porter Russell: *See—*
Pease, Floyd Tim; Reusswig, Gerhard Helmut; and Edling, Porter Russell, 4,068,487, Cl. 61-93.000.

Edward Shanbrom, Inc.: *See—*
Shanbrom, Edward, 4,069,216, Cl. 260-112.00B.

Edwards Engineering Corporation: *See—*
Edwards, Ray C., 4,068,710, Cl. 165-111.000.

Edwards, Ray C., to Edwards Engineering Corporation. Vapor condenser for vapor recovery systems. 4,068,710, Cl. 165-111.000.

Eggert, Frank, to Schlegel GmbH. Method and apparatus for producing accumulator plate separator pockets. 4,069,079, Cl. 156-212.000.

Eigenmann, Ludwig. Prefabricated roadway marking strip material and method for producing same. 4,069,281, Cl. 264-1.000.

Ekwall, Carl Gosta Bernhard: *See—*
Andersson, Kurt Holger; Ekwall, Carl Gosta Bernhard; and Forsberg, Bo Erik, 4,068,727, Cl. 173-1.000.

Elder, George E.; Van Horne, Clark A.; and Wu, George C., to Velo-Bind, Inc. Cutting means for book binding machine. 4,068,997, Cl. 425-305.100.

ElectroPrint, Inc.: *See—*
Thompson, Lester E., 4,068,585, Cl. 101-114.000.

Elfert, Klaus; Hinz, Jurgen; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Semipermeable membranes of sulphonated polybenz-1,3-oxazin-2,4-diones. 4,069,215, Cl. 260-79.30R.

Elitex, koncern textilniho strojirenstvi: *See—*
Svaty, Vladimir, 4,068,686, Cl. 139-438.000.

Ellenberger & Poensgen GmbH: *See—*
Krasser, Fritz; and Sell, William F., 4,069,289, Cl. 264-157.000.

Emblem, Harold Garton; and Shaw, Richard Dudley. Refractory materials. 4,068,701, Cl. 164-16.000.

EMC Technology, Inc.: *See—*
Steidlitz, Mark, 4,069,497, Cl. 357-80.000.

Emery Industries, Inc.: *See—*
Hutchison, Robert B.; and Blewett, C. William, 4,069,236, Cl. 260-414.000.
McCarthy, Justin P.; Schlossman, Mitchell L.; and Mores, Lee R., 4,069,347, Cl. 424-358.000.

Emmett, John Colin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,069,327, Cl. 424-250.000.

English Electric Valve Company Limited: *See—*
Nelson, Peter David; and Banks, Peter Baldwin, 4,069,502, Cl. 358-113.000.

Enomoto, Satoru: *See—*
Nishita, Sadao; Enomoto, Satoru; Wada, Hisayuki; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,069,211, Cl. 260-77.5MA.

Enos, Ellsworth C.: *See—*
Camp, Edward C.; Enos, Ellsworth C.; and Bombara, Dennis Michael, 4,068,412, Cl. 51-5.00D.

Entreprise de Recherches et d'Activites Petrolieres (E.R.A.P.): *See—*
Jegousse, Michel J., 4,068,490, Cl. 61-108.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,068,491, Cl. 61-110.000.

Equipment Precibec Inc.: *See—*
Poitras, Andre; and Tailleux, Christian, 4,068,582, Cl. 101-76.000.

Erbert, Virgil; and Braun, Leroy O., to Hughes Aircraft Company. Range testing system having simulated optical targets. 4,068,952, Cl. 356-5.000.

Erdelen, Gerhard: *See—*
Beck, Heinz; Muller, Klaus; and Erdelen, Gerhard, 4,069,131, Cl. 204-297.00W.

Erdman, Peter M. Brick saw apparatus. 4,068,648, Cl. 125-13.00R.

Eschweiler, Earl E., Jr.; and Smith, Richard B., to Pitney-Bowes, Inc. Document feeding apparatus. 4,068,946, Cl. 355-64.000.

Eskeli, Michael. Fluid pressurizer. 4,068,975, Cl. 415-80.000.

Etudes Petrolieres Marines: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,068,491, Cl. 61-110.000.

Etudes Petrolieres Marines, Societe: *See—*
Jegousse, Michel J., 4,068,490, Cl. 61-108.000.

Evans, Arlyn Wayne, to Du Pont de Nemours, E. I., and Company. Selective herbicide for pineapple crops. 4,069,037, Cl. 71-93.000.

Evans, Robert F., to Du Pont de Nemours, E. I., and Company. Electrical connector. 4,068,915, Cl. 339-176.0MP.

Excelsior Hardware Co.: *See—*
Testa, Carmen; and Bouton, William J., Jr., 4,068,873, Cl. 292-101.000.

Exxon Production Research Company: *See—*
Cooke, Claude E., Jr.; Hedden, Walter A.; and Chard, William C., 4,068,718, Cl. 166-280.000.
Cunningham, Allen B.; and Miller, Edward T., 4,069,470, Cl. 340-15.5TA.

Exxon Research & Engineering Co.: *See—*
Brois, Stanley J.; Ryer, Jack; and Winans, Esther, 4,069,023, Cl. 44-63.000.
Gardiner, John Brooke; Hill, Max W.; and Ryer, Jack, 4,069,162, Cl. 252-32.70E.
Riley, Kenneth L.; and Pine, Lloyd A., 4,069,139, Cl. 208-216.000.
Siskin, Michael; and Gillespie, Ronald J., 4,069,268, Cl. 260-666.00P.
Thompson, Arthur H., 4,069,301, Cl. 423-565.000.

F. Jos. Lamb Company: *See—*
Brems, John H.; Kobane, John, Jr.; and Zetner, Wilfred J., 4,068,957, Cl. 403-8.000.

Fairchild Camera and Instrument Corporation: *See—*
Barnett, James V., II; Mayer, Ernest F.; Pfeiffer, James W.; and Wickwar, Larry D., 4,068,464, Cl. 58-50.00R.
Duff, Donald R.; Lamb, James O.; and Pezzolo, Donald E., 4,068,462, Cl. 58-23.0AC.

Fanning, Larry J.; and Duimstra, Dwight L., to Duimstra, Dwight L. Portable hoist. 4,068,827, Cl. 254-139.100.

Farcy, Jean-Claude; Girard, Genevieve; and Michon, Maurice, to Compagnie General d'Electricite. Power laser chain. 4,069,458, Cl. 330-4.300.

Farnsworth, Robert P., to Hughes Aircraft Company. Flyback type power supply. 4,069,449, Cl. 363-28.000.

Fassbender, Rolf: *See—*
Lang, Armin; and Fassbender, Rolf, 4,068,678, Cl. 137-100.000.

Fassett, John R.; Rondas, Ivan V.; George, Joseph P.; and Sondermann, Claus, to Frontier Inc. Digital electronic alarm watch. 4,068,461, Cl. 58-23.00R.

Fay, Gordon C., to Hendryx Engineers Incorporated. Kiln for ceramic products. 4,069,010, Cl. 432-137.000.

Fay, Robert C., to Milliken Research Corporation. Pre-determined pressure system. 4,068,561, Cl. 91-433.000.

Fechner, Wolf Dieter: *See—*
Nett, Robert; Fechner, Wolf Dieter; Jettmar, Werner; Polster, Rudolf; Sappok, Reinhard; and Hartmann, Eduard, 4,069,064, Cl. 106-193.00P.

Fedor, Robert J.; and Smith, Walter E., to Gould Inc. Fine dispersion aluminum base bearing. 4,069,369, Cl. 428-557.000.

Fegley, Charles R. Electrothermally actuated fluid dispensing device. 4,068,780, Cl. 222-5.000.

Felten, Alain: *See—*
Laurent, Daniel; and Felten, Alain, 4,068,829, Cl. 366-177.000.

Fernandes, John Henry, to Combustion Engineering, Inc. Two-stage gasification system. 4,069,024, Cl. 48-197.00R.

Ferranti Limited: *See—*
Grundy, David Latham, 4,069,494, Cl. 357-41.000.

Ferranti-Packard Limited: *See—*
Helwig, Christopher Gordon, 4,069,480, Cl. 340-373.000.

Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., to FMC Corporation. Water dispersible, low molecular weight polyamide resin particles of uniform sizes, method of preparing same and coatings formed therefrom. 4,069,184, Cl. 260-29.20N.

Ferris, Ray L.: *See—*
Marulic, Walter J.; and Ferris, Ray L., 4,068,410, Cl. 49-370.000.

Ferriss, Lincoln Stark, to Singer Company, The. ESG Reflected impedance pickoff. 4,068,533, Cl. 74-5.60D.

Fiber Industries, Inc.: *See—*
Fischbach, Melvyn Robert, 4,068,460, Cl. 57-157.0TS.

Ficheux, Rene; and Ronsin, Francois, to United Technologies Corporation. Elevator motor control system for A.C. induction motor. 4,068,741, Cl. 187-29.00R.

Fickes, Michael Glenn, to Du Pont de Nemours, E. I., and Company. Liquid lamination process. 4,069,076, Cl. 156-83.000.

Fiedler, Willy A. Fuel control of internal combustion engines. 4,068,626, Cl. 123-30.00D.

Fields, Ellis K., to Standard Oil Company (Indiana). Silver catalysts. 4,069,271, Cl. 260-669.00R.

Fima Laboratories, Inc.: *See—*
Fima, Raoul, 4,069,405, Cl. 200-84.00C.

Fima, Raoul, to Fima Laboratories, Inc. Swimming pool alarm system. 4,069,405, Cl. 200-84.00C.

Findeisen, Kurt; Draber, Wilfried; and Schwarz, Herbert, to Bayer Aktiengesellschaft. Process for the preparation of certain acyl cyanide compounds. 4,069,252, Cl. 260-545.00R.

Fine, Gary J.; Herschler, Michael G.; and Shoop, John C., to Gardner-Denver Company. Compressor startup control. 4,068,980, Cl. 417-282.000.

Fiorenza, Robert M.; Fleming, Alan J.; Gerlach, Ralph J.; Holmstrom, Larry W.; and Pace, John C., to International Business Machines Corporation. Computer controlled distribution apparatus for distributing transactions to and from controlled machines tools. 4,069,488, Cl. 364-474.000.

Firester, Arthur Herbert; and Walentine, Joseph Paul, to RCA Corporation. Defect plotting system. 4,069,484, Cl. 346-33.00F.

Fisch, Irvin S.: *See—*
Peer, Roger L.; and Fisch, Irvin S., 4,069,136, Cl. 208-65.000.

Fischbach, LeRoy J.: *See—*
Cosentino, Louis C.; and Fischbach, LeRoy J., 4,068,521, Cl. 73-19.000.

Fischbach, Melvyn Robert, to Fiber Industries, Inc. Yarn process. 4,068,460, Cl. 57-157.0TS.

Fischer, Albert G., to Westinghouse Electric Corporation. Method for rapidly forming photoconductive layers for integrated circuits. 4,069,356, Cl. 427-76.000.

Fisher, Bruce S.: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,069,151, Cl. 128-214.00R.

Fleming, Alan J.: *See—*
Fiorenza, Robert M.; Fleming, Alan J.; Gerlach, Ralph J.; Holmstrom, Larry W.; and Pace, John C., 4,069,488, Cl. 364-474.000.

Fleming, Paul D.; and Gullekson, Kenneth N., to W & F Manufacturing Inc. Rotary latch mechanism with locking device. 4,068,874, Cl. 292-128.000.

Fleury, Guy J.: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,068,491, Cl. 61-110.000.

Flick, Roland Edward: *See—*
Whitney, John Kimball; Cosgrove, Allan Hugh; and Flick, Roland Edward, 4,068,870, Cl. 285-320.000.

Flynn, Thomas P., to Super Products Corporation. Power boom and vacuum hose support. 4,068,824, Cl. 254-124.000.

FMC Corporation: *See—*
Ferraro, Charles F.; Javick, Richard A.; and Robertson, James A., 4,069,184, Cl. 260-29.20N.
Lodholz, John C.; and Straus, P. Barry, 4,069,150, Cl. 210-112.000.
Meadow, Morton, 4,069,302, Cl. 423-575.000.

Foeller, James E. Automatic vehicle speed limiting system. 4,068,734, Cl. 180-98.000.

Foley, Nelson D., to BEI Electronics, Inc. Ammunition identification and firing system having electrical identification means. 4,068,556, Cl. 89-1.814.

Folson, Henry J.: *See—*
Meyers, Frank; Folson, Henry J.; and Meyers, Gwenn B., 4,068,478, Cl. 61-1.00F.

Ford, Bacon & Davis Texas Inc.: *See—*
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,069,020, Cl. 23-262.000.

Ford Motor Company: *See—*
Dickie, Ray A.; and Cassatta, Joseph C., 4,069,364, Cl. 428-276.000.
Labana, Santokh S.; and Theodore, Ares N., 4,069,275, Cl. 260-836.000.

Forrest, Charles Phelps. Place-kicking football receiving target. 4,068,846, Cl. 273-55.00B.

Forsberg, Bo Erik: *See—*
Andersson, Kurt Holger; Ekwall, Carl Gosta Bernhard; and Forsberg, Bo Erik, 4,068,727, Cl. 173-1.000.

Forster, Rene: *See—*
Dur, Werner; and Forster, Rene, 4,068,906, Cl. 308-3.00A.

Forster, William Edward, to Metal Box Limited. Folded closed carton convertible to open tray. 4,068,795, Cl. 229-31.00R.

Forward, Raymond John, to Steam Vacuum Extraction Limited. Steam and vacuum cleaning apparatus. 4,068,340, Cl. 15-321.000.

Foster, George B.; and Gibbs, Paul Douglas, to Air Data, Inc. Area navigation system. 4,069,412, Cl. 364-448.000.

Foster Grant Co., Inc.: *See—*
Baum, Sidney J.; and Mayr, Anton J., 4,068,616, Cl. 118-8.000.

Foulletier, Louis: *See—*
Bertocchio, Rene; and Foulletier, Louis, 4,069,158, Cl. 252-3.000.
Fox, Edward M.: *See—*
Lodato, Alphonso; Cornacchio, Americo; and Fox, Edward M., 4,068,911, Cl. 339-90.00R.
Fox, Sidney Jared, to International Business Machines Corporation. Single array ink jet printer. 4,069,486, Cl. 346-75.000.
Frank, Fred J., to Westinghouse Electric Corporation. Method and apparatus for monitoring flux deviations in a nuclear reactor. 4,069,097, Cl. 176-22.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,068,596, Cl. 104-12.000.
Frenkel, Mark Isaakovich. Cylinder of piston compressor. 4,068,562, Cl. 92-60.500.
Freuler, Fred H. Press roll with bending control device. 4,068,360, Cl. 29-116.0AD.
Freund, Peter: *See—*
Gey, Werner; Langhauser, Wolfgang; Heinze, Helmut; Rothe, Hans-Joachim; and Freund, Peter, 4,069,194, Cl. 260-40.00R.
Frey, Rudolf; Bernauer, Joachim; and Gobel, Pirmin, to Albert Frankenthal AG. Cylinder for clamping printing plates. 4,068,586, Cl. 101-415.100.
Frick Company: *See—*
Mandy, Zoltan A., 4,068,981, Cl. 417-310.000.
Friddle, William B.: *See—*
Gross, Nathan; and Friddle, William B., 4,068,329, Cl. 5-255.000.
Friedline, Ernest J., to Kennametal Inc. Cutting insert configuration. 4,068,976, Cl. 407-114.000.
Friedrich Kocks, Firma: *See—*
Wonisch, Rudolf, 4,068,516, Cl. 72-201.000.
Friesem, Albert A.: *See—*
Reich, Shymon; and Friesem, Albert A., 4,069,049, Cl. 96-27.00H.
Friesenborg, Bernd; and Eberhardt, Helmut, to Transportbeton-Beratungs-Gesellschaft mit beschrankter Haftung. Purification apparatus for water purification and purification system therefor. 4,069,143, Cl. 209-10.000.
Friktions-Stamp AB: *See—*
Andersson, Karl Gunnar, 4,068,816, Cl. 248-251.000.
Frontier Inc.: *See—*
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Frontier Machinery, Inc.: *See—*
Pringle, Ray T.; and Ames, Kenneth R., 4,068,679, Cl. 137-344.000.
Froome, Keith Davy; and Russell, George, to National Research Development Corporation. Distance measuring apparatus. 4,068,951, Cl. 356-5.000.
Frost, Donald L. Heavy-duty swivel arm-wrestler and exerciser. 4,068,843, Cl. 272-118.000.
Frye, George Joseph, to Tektronix, Inc. Stabilized high-efficiency sampling system. 4,069,447, Cl. 320-1.000.
Frymark, Norbert F. *See—*
Bollinger, Parker A., Jr.; and Frymark, Norbert F., 4,069,464, Cl. 337-77.000.
Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Apparatus and methods for forming multiple elongated products. 4,068,512, Cl. 72-41.000.
Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Methods and apparatus for forming wire tapes. 4,068,517, Cl. 72-253.00R.
Fuji Electric Co., Ltd.: *See—*
Nagasawa, Ikuo; Mukae, Kazuo; Ishii, Takashi; and Tsuda, Koichi, 4,069,061, Cl. 106-73.200.
Fuji Jukogyo Kabushiki Kaisha: *See—*
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Fuji Photo Film Co., Ltd.: *See—*
Dezawa, Shin-ichiro; Sasazawa, Koji; and Kitamoto, Tatsuji, 4,069,164, Cl. 252-62.620.
Hara, Hiroshi; and Kusaba, Hideyuki, 4,069,050, Cl. 96-60.00R.
Matsukawa, Hiroharu; and Hayashi, Takao, 4,069,353, Cl. 427-57.000.
Tadokoro, Eiichi; Aonuma, Masashi; and Tamai, Yasuo, 4,069,073, Cl. 148-105.000.
Tsubota, Motohiko; Hanai, Sosuke; Oishi, Yasushi; Sera, Hidefumi; and Yamamoto, Nobuo, 4,069,048, Cl. 96-3.000.
Fujie, Seijiro, to Pioneer Electronic Corporation. Method and apparatus for pilot signal cancellation in an FM multiplex demodulator. 4,069,398, Cl. 179-15.0BT.
Fujimura, Shigeru: *See—*
Sato, Fumio; Fujimura, Shigeru; and Urakawa, Toshio, 4,068,583, Cl. 101-93.040.
Fukinbara, Itaru: *See—*
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Fulk, James B., to Paper Converting Machine Company. Method for manufacture of business forms. 4,068,973, Cl. 270-52.500.
Fullalove, Richard; and Spencer, Frederick, to Henry Simon Limited. Rollermills. 4,068,803, Cl. 241-32.000.
Furman, Edward R.: *See—*
Alger, Donald L.; Schwab, William B.; and Furman, Edward R., 4,068,495, Cl. 62-376.000.
Furtado, Anthony E.: *See—*
Butler, L. Dennis; Butler, Gene R.; Furtado, Anthony E.; Welker, Jerry W.; and Grey, Donald M., 4,068,804, Cl. 241-101.700.
Fuzikawa, Iwao: *See—*
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G. D. Searle & Co.: *See—*
Adelstein, Gilbert W., 4,069,223, Cl. 260-293.760.
Weier, Richard M., 4,069,219, Cl. 260-239.570.
Yonan, Peter K., 4,069,221, Cl. 260-293.620.
G. Siempelkamp & Co.: *See—*
Ufermann, Werner; Axer, Heinrich; and Michels, Wolfgang, 4,068,991, Cl. 425-81.000.
Gabano, Jean-Paul, to Saft-Societe des Accumulateurs Fixes et de Traction. Positive active material for primary batteries having high energy density. 4,069,373, Cl. 429-194.000.
Gabano, Jean-Paul, to Saft-Societe des Accumulateurs Fixes et de Traction. High energy density electric cells. 4,069,374, Cl. 429-197.000.
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, to Rohm GmbH. Method for preparing glycol esters. 4,069,381, Cl. 560-1.000.
Gagle, Duane W.; and Draper, Homer L., to Phillips Petroleum Company. Roadway barrier structure and method of making. 4,068,968, Cl. 404-7.000.
Gall, Rudi: *See—*
Berger, Herbert; Gall, Rudi; Thiel, Max; Schaumann, Wolfgang; and Vomel, Wolfgang, 4,069,330, Cl. 424-267.000.
Ganaway, Franklin D.: *See—*
Rutledge, Robert W.; and Ganaway, Franklin D., 4,069,413, Cl. 364-118.000.
Ganellin, Charon Robin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,069,327, Cl. 424-250.000.
Gardiner, John Brooke; Hill, Max W.; and Ryer, Jack, to Exxon Research & Engineering Co. Haze free oil additive compositions containing polymeric viscosity index improver and process for producing said compositions. 4,069,162, Cl. 252-32.70E.
Gardner-Denver Company: *See—*
Fine, Gary J.; Herschler, Michael G.; and Shoop, John C., 4,068,980, Cl. 417-282.000.
Gardner, Jeffrey M., to Container Corporation of America. Cushioning insert. 4,068,793, Cl. 229-14.00C.
Garmire, Elsa: *See—*
Bass, Michael; Garmire, Elsa; and McMahon, Thomas R., 4,068,920, Cl. 350-96.0WG.
Garner, Lloyd L.; and Harris, Charles Richard, to Smith International, Inc. Extended nozzle and bit stabilizer and method of producing. 4,068,731, Cl. 175-339.000.
Garrett Corporation, The: *See—*
Wood, Palmer R.; and Rhoden, James A., 4,068,468, Cl. 60-39.140.
Garrett, Roger E., to University of California, The Regents of the. Radiation source shielding and collimating device. 4,069,423, Cl. 250-493.000.
Garvey, Edward N.: *See—*
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Gascoyne, John M.; Hems, Roger; and Spring, David J., to Wilkinson Sword Limited. Compositions having a physiological cooling effect. 4,069,345, Cl. 424-343.000.
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Gates, H. Gordon, to Gates & Sons, Inc. Clamping lock for tie rod ends. 4,068,818, Cl. 249-42.000.
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Gatewood, Sidney Ulane, to Borg-Warner Corporation. Automatic adjuster for clutch linkages. 4,068,750, Cl. 192-111.00A.
Gaudette, Roger Robert; Ohlson, John Leonard; and Scanlon, Patricia Marie, to W. R. Grace & Co. N,N-di-(hydroxybenzyl)-trimethylene diaminediacetic acids. 4,069,249, Cl. 260-519.000.
Gawelko, Leonard: *See—*
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Gaymar Industries Incorporated: *See—*
Whitney, John Kimball; Cosgrove, Allan Hugh; and Flick, Roland Edward, 4,068,870, Cl. 285-320.000.
Gazard, Maryse: *See—*
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Geers, Leo: *See—*
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GEL, Inc.: *See—*
Zito, Ralph, 4,069,371, Cl. 429-21.000.
Genakis, Joseph M., to Pollack, Benjamin D. Pin tumbler lock with pull resistant plug. 4,068,508, Cl. 70-364.00A.
Genakis, Joseph M., to Pollack, Benjamin D. Pin tumbler lock cylinder. 4,068,509, Cl. 70-364.00A.
General Atomic Company: *See—*
Arya, Satya Prakash, 4,068,692, Cl. 141-392.000.
General Bathroom Products Corporation: *See—*
Palka, James J., 4,069,450, Cl. 312-257.00R.

General Dynamics Corporation: *See—*
Decoppet, Jean-Pierre, 4,068,419, Cl. 52-40.000.
Parker, Clarence B.; McCray, Peter M.; and Taylor, L. Lamoyne, 4,069,482, Cl. 343-7.700.
General Electric Company: *See—*
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Bonnice, Phillip E., 4,068,416, Cl. 51-325.000.
Borman, Willem Frederik Hendrik; Craft, Donald Irving; and Kramer, Mortor, 4,069,278, Cl. 260-860.000.
Caulier, Paul W., 4,068,811, Cl. 246-169.00A.
Crivello, James V., 4,069,055, Cl. 96-115.00R.
Crivello, James V., 4,069,056, Cl. 96-115.00P.
Cushing, Donald S., 4,069,425, Cl. 134-57.00D.
Dawson, Charles W., 4,068,999, Cl. 425-392.000.
Greenhalgh, Milton Sharples, 4,069,286, Cl. 264-85.000.
Houston, John M.; Young, James R.; and Whetten, Nathan R., 4,069,438, Cl. 313-346.00R.
Losert, Gerhard K., 4,068,815, Cl. 248-188.200.
Lubowski, Stanley J.; and Swank, Robert K., 4,069,355, Cl. 427-70.000.
Mark, Victor, 4,069,201, Cl. 260-45.95R.
Petrus, George P., 4,068,511, Cl. 72-13.000.
Sherman, Ralph R., Jr., 4,069,455, Cl. 325-469.000.
Simmons, John Robert, 4,068,471, Cl. 60-262.000.
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Mercer, Robert R., 4,068,871, Cl. 292-48.000.
Podolan, Edward G.; Przybysz, Francis C.; and Jozefczak, Thadius F., 4,068,407, Cl. 49-215.000.
Geophysical Systems Corporation: *See—*
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Gerhard Riegraf KG: *See—*
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Gernhardt, Paul D., to Slater Electric Inc. Threaded fastener mounting means. 4,069,448, Cl. 220-3.200.
Gerth, William V. Convertible furniture. 4,068,328, Cl. 5-13.000.
Geshner, Robert Andrew; and Sciambi, Louis Joseph, to RCA Corporation. Photomask dryer. 4,068,390, Cl. 34-239.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Stuckmann, Dieter; Jutte, Hans; Babendererde, Siegmund; and Bokemeyer, Reinhard, 4,068,485, Cl. 61-85.000.
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Gey, Werner; Langhauser, Wolfgang; Heinze, Helmut; Rothe, Hans-Joachim; and Freund, Peter, to Zimmer Aktiengesellschaft. Process for the solid state polycondensation of linear polyesters. 4,069,194, Cl. 260-40.00R.
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Foster, George B.; and Gibbs, Paul Douglas, 4,069,412, Cl. 364-448.000.
Gibson, Harold: *See—*
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Giesecke, Hans D.; and Weems, Sterling J., to Westinghouse Electric Corporation. Steam generator with vertical tubesheets. 4,068,627, Cl. 122-34.000.
Gilbert & Bennett Mfg. Co., The: *See—*
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Gillespie, Ronald J.: *See—*
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Gilson Brothers Company: *See—*
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Girard, Genevieve: *See—*
Farcy, Jean-Claude; Girard, Genevieve; and Michon, Maurice, 4,069,458, Cl. 330-4.300.
Giuliani, Chester J., to UOP Inc. Hydrogen-producing hydrocarbon conversion with gravity-flowing catalyst particles. 4,069,135, Cl. 208-65.000.
Glaze, John W., Jr.; and Graves, Billy Mac, to Intech Corporation. Bi-component friction disc for yarn texturing. 4,068,457, Cl. 57-77.400.
Glenn, Eldridge Myles: *See—*
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Glover, J. Raymond. Wood-frame glass door unit. 4,068,433, Cl. 52-207.000.
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Goetz, Heinz E.: *See—*
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Goings, Shelby H. Spraying system to control air-borne coal dust. 4,068,802, Cl. 239-419.500.
Goins, Robert R., to Phillips Petroleum Company. Blending of particulate materials. 4,068,828, Cl. 366-136.000.
Golden, Gerald S.: *See—*
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Goldenberg, Henry Robert; Peck, Richard John; Tong, Shih Yung; and Webb, David Allen, to Bell Telephone Laboratories, Incorporated. Dual speed full duplex data transmission. 4,069,392, Cl. 178-58.00R.
Goldman, Diana. Article of chidrens protective clothing in combination with an article of use. 4,068,313, Cl. 2-49.00R.
Goldstein, Harold, to Control Electronics Co., Inc. Electronic thermometer. 4,068,526, Cl. 73-362.0AR.
Goldsworthy, William B.; and Karlson, Harald E., to McDonnell Douglas Corporation. Method and apparatus for fabricating open weave scrim cloth. 4,068,357, Cl. 28-101.000.
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Hampshire, William J., 4,069,000, Cl. 425-395.000.
Hunter, Edward E., 4,068,617, Cl. 118-50.000.
Meyer, Glen E., 4,069,384, Cl. 560-91.000.
Gordon, Donald W.; and Robinson, Dar A. Disaster evacuation air cushion. 4,068,739, Cl. 182-139.000.
Gorling, Karl Goran; Edenwall, Ingvar A. O.; Jansson, Jan-Olof; and Mioen, Thomas K., to Boliden Aktiebolag. Method of recovering non-ferrous metals from sulphidic materials. 4,069,041, Cl. 75-101.00R.
Gosling, Claus: *See—*
Simm, Walter; Gosling, Claus; Bonart, Richard; and von Falkai, Bela, 4,069,026, Cl. 55-6.000.
Gostomski, Richard B. Telescopic cover assembly for open bed vehicles. 4,068,886, Cl. 296-137.00B.
Goudreau, Noel G., to Icon American International, Inc. Ball holder connector. 4,068,785, Cl. 224-5.00D.
Gould Inc.: *See—*
Fedor, Robert J.; and Smith, Walter E., 4,069,369, Cl. 428-557.000.
Kowal, Leonard J.; and Garvey, Edward N., 4,068,515, Cl. 72-115.000.
Gow Enterprises Limited: *See—*
Westerlund, G. Oscar, 4,069,128, Cl. 204-258.000.
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Quarve, Vernon K., 4,068,982, Cl. 417-387.000.
Graham, Thomas G.; Maltese, John; Nesson, Israel; and Mitchell, Robert, to Berkey Photo, Inc. Camera construction. 4,069,490, Cl. 354-83.000.
Grandchamp, Pierre-Andre: *See—*
Burckhardt, Christoph Benedikt; Grandchamp, Pierre-Andre; and Hoffmann, Heinz, 4,069,467, Cl. 340-1.00R.
Granryd, Thorvald G. Four sprocket wheel drive system for track-type vehicle. 4,068,732, Cl. 180-6.700.
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Glaze, John W., Jr.; and Graves, Billy Mac, 4,068,457, Cl. 57-77.400.
Gray, Edward L.; and Browning, Bruce E., Jr. Foldable bench for a portable hand-held circular saw. 4,068,550, Cl. 83-471.200.
Gray, Joseph B., to Du Pont de Nemours, E. I., and Company. Mixing method and system. 4,068,830, Cl. 366-174.000.
Graystone Corporation: *See—*
Weber, Robert A.; and Allmer, Franz, 4,068,595, Cl. 104-12.000.
Green, Bernard J.; and Chorosevic, Jerome J., to Plumbium Manufacturing Corporation. Electronic wheel balancer apparatus and method. 4,068,532, Cl. 73-462.000.
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Greenberg, Robert, to Trufuse International Ltd. Apparatus for making material with fusible backing. 4,068,618, Cl. 118-60.000.
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Greenhalgh, Milton Sharples, to General Eiectric Company. Method of thermally curing polymeric materials. 4,069,286, Cl. 264-85.000.
Greenwood, Arthur R., to UOP Inc. Hydrogen-producing hydrocarbon conversion with gravity-flowing catalyst particles. 4,069,134, Cl. 208-64.000.

Greenwood, Arthur R. Hydrogen-producing hydrocarbon conversion with gravity-flowing catalyst particles. 4,069,137, Cl. 208-65.000.
Greer, Edward M. Locking ring assembly for the liquid port of a pressure accumulator. 4,068,684, Cl. 138-30.000.
Greive, Aloys, to Hamel GmbH Zwirnmaschinen. Balloon suppressor for light and heavy yarns. 4,068,458, Cl. 57-108.000.
Grey, Donald M.: *See*—
Butler, L. Dennis; Butler, Gene R.; Furtado, Anthony E.; Welker, Jerry W.; and Grey, Donald M., 4,068,804, Cl. 241-101.700.
Grihangne, Andre. Ground-reaction machines. 4,068,735, Cl. 180-128.000.
Gromov, Evgeny Ivanovich: *See*—
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Gross, Nathan; and Friddle, William B., to Restonic Corporation. Modular box spring assembly. 4,068,329, Cl. 5-255.000.
Grosse, Ludwig; and Dorr, Hans-Werner, to Hoechst Aktiengesellschaft. Process for the transformation of a comminuted swellable cellulose ether into an easily workable material. 4,069,082, Cl. 156-281.000.
Groupement Europeen de la Cellulose: *See*—
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GTE Sylvania Incorporated: *See*—
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Gubitose, Nicholas Francis; Gawelko, Leonard; and Satriano, Robert Joseph, to RCA Corporation. Method for cracking brittle material. 4,068,788, Cl. 225-1.000.
Guerit, Pierre; and Pollet, Gilbert, to Servimetal. Method of drawing light metals and alloys at very high speeds. 4,068,513, Cl. 72-42.000.
Guerra, Romeo E., to Alfohn Corporation. Method and apparatus for breaking the habit of smoking. 4,068,672, Cl. 131-170.00A.
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Gundelfinger, Richard, to Rheodyne Incorporated. Two position rotary valve for injecting sample liquids into an analysis system. 4,068,528, Cl. 73-422.0GC.
Gunther, Donald A., to American Sterilizer Company. Method of destroying pyrogens. 4,069,153, Cl. 210-64.000.
Gunther, William H., Jr., to Thor Dahl, Inc. Envelope opening machine. 4,069,011, Cl. 432-230.000.
Gurgiolo, Arthur E., to Dow Chemical Company, The. Process for preparation of β-hydroxy esters by reaction of organic carboxylic acids and vicinal epoxides. 4,069,242, Cl. 560-93.000.
Gutermuth, Hermann; and Hebel, Gerd, to Kohlensaeure-Werke Rudolf Buse Sohn, Firma. Process for the uninterrupted manufacture of plastic film tubing. 4,069,282, Cl. 264-28.000.
Gutner, Kenneth H. Canopy frame for bed. 4,068,333, Cl. 5-362.000.
Gvinepadze, Alexei Davidovich: *See*—
Vitaliev, Georgy Viktorovich; Gvinepadze, Alexei Davidovich; Smirnov, Rem Vasilievich; and Sofiisky, Gury Dmitrievich, 4,069,473, Cl. 365-49.000.
Gwon, Pu Gill. Athletic protective system. 4,068,323, Cl. 2-413.000.
Gyori, Robert Paul, to De luxe General, Incorporated. Additive color printer control. 4,068,943, Cl. 355-38.000.
H & H Licensing Corporation: *See*—
Spindler, Walter G., 4,068,984, Cl. 418-9.000.
Hacker nee Weimer, Valerie Kathryn: *See*—
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Hackett, Robert H., to IDL Incorporated. Graphic merchandising gondola. 4,068,855, Cl. 280-79.300.
Hagenuk Vormals Neufeldt & Kuhnke GmbH: *See*—
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Hamlet, Buck C.: *See*—
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Hampshire, William J., to Goodyear Tire & Rubber Company, The. Mold for shaping and curing reinforced plastic material. 4,069,000, Cl. 425-395.000.
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Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., to Hanson Industries Inc. Ankle pad for footwear. 4,068,337, Cl. 12-142.00P.
Hanson, Chris A.: *See*—
Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., 4,068,337, Cl. 12-142.00P.
Hanson, Donald E. Wheel-balancing weight having recording surface. 4,068,898, Cl. 301-5.00B.
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Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., 4,068,337, Cl. 12-142.00P.
Hara, Hiroshi; and Kusaba, Hideyuki, to Fuji Photo Film Co., Ltd. Image forming process. 4,069,050, Cl. 96-60.00R.
Hara, Kinihiko: *See*—
Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kinihiko, 4,069,009, Cl. 432-122.000.
Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, to Teijin Limited. Novel aromatic imine polymers and process for the preparation thereof. 4,069,206, Cl. 260-49.000.
Haraikawa, Tetsuo, to Tokico Ltd. Disc brake. 4,068,745, Cl. 188-73.300.
Haraikawa, Tetsuo: *See*—
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Harbulak, Edward P., to M & T Chemicals Inc. Electroplating of nickel, cobalt, mutual alloys thereof or ternary alloys thereof with iron. 4,069,112, Cl. 204-43.00T.
Harmon, G. Lamar. Controllable wing sail. 4,068,607, Cl. 114-102.000.
Harmsen, Nils; and Sperner, Franz, to W. C. Heraeus GmbH. Electrical contact material, and terminal. 4,069,370, Cl. 428-671.000.
Harney, Robert C.; and Bloom, Stewart D. Raman scattering method and apparatus for measuring isotope ratios and isotopic abundances. 4,068,953, Cl. 356-75.000.
Harper, Paul W., to Our Mother of Sorrows Church. Tool for placing lids on cups. 4,068,449, Cl. 53-319.000.
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Harris, Herbert. Safety spare tire locking bolt. 4,068,856, Cl. 280-179.00R.
Harrison, George; and Harrison, Nelson, to Harrison, Nelson K. Bicycle. 4,068,858, Cl. 280-289.00R.
Harrison, Michael, to Colgate Palmolive Company. Method for the manufacture of clear dentifrices. 4,069,310, Cl. 424-49.000.
Harrison, Nelson: *See*—
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Hasegawa, Toru: *See—*
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Hashimoto Corporation Kabushiki Kaisha: *See—*
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Hashimoto, Kazuo, to Hashimoto Corporation Kabushiki Kaisha. Automatic telephone answering device. 4,069,397, Cl. 179-6.00R.

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Haskell, Theodore Herbert: *See—*
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Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, to Hoffmann-La Roche Inc. Substituted phenyl ketones. 4,069,229, Cl. 260-308.00R.

Hauber, Peter Fritz, to Reflectolite Products, Inc. Vent operator. 4,068,408, Cl. 49-324.000.

Hawkins, Roland L., to Hoechst Fibers Industries, Division of American Hoechst Corporation. Texturing finish for synthetic filaments. 4,069,160, Cl. 252-8.900.

Hayashi, Hideki; and Ishii, Sadayoshi. Injection molding machine for the manufacture of shoes. 4,068,995, Cl. 425-129.00S.

Hayashi, Katsuhiko: *See—*
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Hayashi, Kohji: *See—*
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Hayashi, Masaki; Kori, Seiji; and Shimoji, Katsuichi, to Ono Pharmaceutical Company. 16-Chloro-substituted prostaglandins and derivatives thereof. 4,069,387, Cl. 560-121.000.

Hayashi, Takao: *See—*
Matsukawa, Hiroharu; and Hayashi, Takao, 4,069,353, Cl. 427-57.000.

Hayashi, Takeshi; and Shibuno, Masao, to Shinagawa Refractories Co., Ltd. Alumina-silicon carbide refractories and their method of manufacture. 4,069,060, Cl. 106-65.000.

Hayek, Mason, to Du Pont de Nemours, E. I., and Company. Antistat and softener for textiles. 4,069,159, Cl. 252-8.800.

Hayes, John C.: *See—*
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Pollitzer, Ernest L.; and Hayes, John C., 4,069,270, Cl. 260-668.00A.

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Haynie, George Roger, to Milliken Research Corporation. Circular knitting machine. 4,068,497, Cl. 66-50.00B.

Haywood, Jay L., to Raymond Lee Organization, Inc., The, a part interest. Convertible shirt. 4,068,316, Cl. 2-126.000.

Healy, James Churchill; and Whitaker, Roy Francis, to B. F. Goodrich Company, The. Asphalt compositions. 4,069,181, Cl. 260-28.5AS.

Hebel, Gerd: *See—*
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Heckley, Warner M.: *See—*
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Hedden, Walter A.: *See—*
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Hegar, Gert, to Ciba-Geigy Corporation. Water-soluble fiber-reactive disazo dyestuffs. 4,069,218, Cl. 260-153.000.

Hehl, Klaus; and Schrankel, Heike, to Riloga-Werk Julius Schmidt. Shower curtain rod assembly. 4,068,345, Cl. 16-94.00D.

Heidenreich, David Charles: *See—*
Charchian, Loris Joseph; and Heidenreich, David Charles, 4,068,748, Cl. 192-41.00A.

Heim, Richard C., to Westinghouse Electric Corporation. Ultrasonic power generator. 4,069,444, Cl. 318-114.000.

Heimark, Edward L.: *See—*
Quinn, Jerome B.; and Heimark, Edward L., 4,068,740, Cl. 184-6.120.

Heinlein, Joseph. Swimming pool surface debris skimmer and method. 4,068,327, Cl. 4-172.150.

Heinrich, Ernst; and Ribka, Joachim, to Cassella Farbwerke Mainkur Aktiengesellschaft. Dyeing of polyester fabric with disazo dye. 4,069,012, Cl. 8-41.00C.

Heinze, Helmut: *See—*
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Heitman, LeRoy Marvin. Ground-moving equipment. 4,068,726, Cl. 172-802.000.

Heitzman, Charles J., to Shannon, William J., a part interest. Apparatus for molding concrete articles and the like. 4,068,996, Cl. 425-253.000.

Helwig, Christopher Gordon, to Ferranti-Packard Limited. Blanking circuit for electromagnetic display. 4,069,480, Cl. 340-373.000.

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Hendryx Engineers Incorporated: *See—*
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Henkel Kommanditgesellschaft auf Aktien: *See—*
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Hennings, Werner, to Bunder Glas GmbH. Injection syringe with separate one-piece finger rest. 4,068,661, Cl. 128-215.000.

Henry Simon Limited: *See—*
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Herbert, John T.; Kovitch, Frank J.; Sullivan, Paul E.; and Vitt, Stanley P., to Murdock Machine & Engineering Company. Single element flexible connection. 4,068,864, Cl. 285-49.000.

Herbst, Benjamin T. Side dump trailer with retractable chute. 4,068,891, Cl. 298-7.000.

Herold, Robert A., to United Technologies Corporation. Method for positioning a strongback. 4,068,702, Cl. 164-30.000.

Herrington, F. John; and Hungerford, Gordon P., to Mobil Oil Corporation. Pressure control in tubular thermoplastic extrusion. 4,069,292, Cl. 264-40.300.

Herscher, Marvin B.: *See—*
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Herschler, Michael G.: *See—*
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Herwig, Warren E.: *See—*
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Hessert, James E.; and Bertus, Brent J., to Phillips Petroleum Company. Method for acidizing subterranean formations. 4,068,714, Cl. 166-246.000.

Hessert, James E.; Bertus, Brent J.; and Johnston, Chester C., Jr., to Phillips Petroleum Company. Method for acidizing subterranean formations. 4,068,720, Cl. 166-282.000.

Hessert, James E.: *See—*
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Hetherington, Matthew J.; Lewis, Richard; and Goode, Graham E., to British Steel Corporation. Non-destructive testing. 4,068,523, Cl. 73-628.000.

Hett, Helmut; and Walser, Kurt, to Cassella Farbwerke Mainkur Aktiengesellschaft. Anti-dusting formulations. 4,069,013, Cl. 8-79.000.

Hexcel Corporation: *See—*
Zemke, Hubert R., Jr., 4,068,861, Cl. 280-610.000.

Hi-Shear Corporation: *See—*
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Hickey, Roy E.: *See—*
Koester, Richard H.; and Hickey, Roy E., 4,068,935, Cl. 353-71.000.

Hicks, Paul E., Jr., to ACF Industries, Incorporated. Vibrator bracket assembly for hoppers and railway cars. 4,068,768, Cl. 214-64.200.

Hidaka, Hiroyoshi; Matsumoto, Ikuo; Hosoi, Masaaki; and Aoki, Nobuo, to Banyu Pharmaceutical Co., Ltd.; Hiroyoshi Hidaka; and Aoki, Nobuo. ω-(Arylsulfonamido)-alkylamine. 4,069,254, Cl. 260-556.0AR.

Hider, Philip Abraham: *See—*
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Highkin, Harry R.: *See—*
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Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., to C. R. Bard, Inc. Thin polycarbonate membranes for use in hemodialysis. 4,069,151, Cl. 128-214.00R.

Higuchi, Takeru; and Hussain, Anwar, to Alza Corporation. Drug-delivery device comprising certain polymeric materials for controlled release of drug. 4,069,307, Cl. 424-22.000.

Hijikata, Akiko: *See—*
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,318, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,323, Cl. 424-244.000.

Hilfiker Pipe Company: *See—*
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Hilfiker, William K., to Hilfiker Pipe Company. Retaining wall structure using precast stretcher sections. 4,068,482, Cl. 61-47.000.

Hill, Amos; Heckley, Warner M.; and Richards, Gerald F., to Avco Corporation. Drive system for hay harvesting and conditioning machine. 4,068,453, Cl. 56-14.400.

Hill, Jerry E.: *See—*
Orem, Henry Philip; Hart, David R.; and Hill, Jerry E., 4,069,220, Cl. 544-186.000.

Hill, Max W.: *See—*
Gardiner, John Brooke; Hill, Max W.; and Ryer, Jack, 4,069,162, Cl. 252-32.70E.

Hilleman, Maurice R.: *See*—
Woodhour, Allen F.; and Hilleman, Maurice R., 4,069,313, Cl. 424-89.000.

Hillesheim, Hans. Method and apparatus for producing openings in sheet material. 4,068,366, Cl. 29-527.400.

Hilti Aktiengesellschaft: *See*—
Osterle, Helmut; and Rangger, Herbert, 4,068,790, Cl. 227-8.000.

Hindle, Peter; and Welsh, William James, to Procter & Gamble Company, The. Method and composition for cleaning polished surfaces. 4,069,066, Cl. 134-6.000.

Hinz, Jurgen: *See*—
Elfert, Klaus; Hinz, Jurgen; and Binsack, Rudolf, 4,069,215, Cl. 260-79.30R.

Hirabayashi, Fumio. Sheet screw. 4,068,554, Cl. 85-41.000.

Hirasawa, Masataka, to Tokyo Shibaura Electric Co., Ltd. Complementary MOS logic circuit. 4,069,426, Cl. 307-205.000.

Hirata, Toshinori; and Yamada, Masamitu, to Mitsui Mining & Smelting Co., Ltd. Apparatus for piling up plate-shaped articles. 4,068,754, Cl. 198-422.000.

Hiroyoshi Hidaka: *See*—
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Hosoi, Masaaki; and Aoki, Nobuo, 4,069,254, Cl. 260-556.0AR.

Hitachi, Ltd.: *See*—
Kamohara, Hideaki; Nakatui, Toji; Yoshitomi, Yuji; Sasaki, Iwao; and Shimada, Kenji, 4,068,372, Cl. 29-727.000.
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Hixson, Elmer L.; and Talkington, Carl M., to Stauffer Chemical Company. Electrolysis control apparatus and method. 4,069,118, Cl. 204-99.000.

Hnojsky, Joseph F. Crank case oil pan. 4,068,646, Cl. 123-195.00C.

Hochtief AG: *See*—
Stuckmann, Dieter; Jutte, Hans; Babendererde, Siegmund; and Bekemeyer, Reinhard, 4,068,485, Cl. 61-85.000.

Hodgson, Clive, to Chevron Research Company. Hydroxy-aluminum chloride and sulfate polymer production. 4,069,299, Cl. 423-462.000.

Hoeboer, Willebrordus Cornelis: *See*—
Scholtus, Christiaan Gustaaf Adolf; Hoeboer, Willebrordus Cornelis; and Ruiter, Antonius, 4,068,791, Cl. 228-45.000.

Hoechst Aktiengesellschaft: *See*—
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Kleiner, Hans-Jerg, 4,069,247, Cl. 260-502.40R.
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Luke, Johannes; Muth, Willy; Riederer, Wolfgang; and Wenzel, Gunter, 4,069,087, Cl. 156-391.000.

Hoechst Fibers Industries, Division of American Hoechst Corporation: *See*—
Hawkins, Roland L., 4,069,160, Cl. 252-8.900.

hoechstmass Balzer GmbH & Co.: *See*—
Krebs, Klaus, 4,068,383, Cl. 33-138.000.

Hoegl, Helmut; and Barchietto, Giacomo, to Xerox Corporation. Polymerized vinyl carbazoles sensitized by nitro-substituted 9-dicyanomethylene fluorenes. 4,069,046, Cl. 96-1.0PC.

Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Heat-activatable polyurethane powder coatings. 4,069,208, Cl. 260-75.0NH.

Hoetker, Carl H., Jr. Mooring anchor. 4,068,609, Cl. 114-301.000.

Hoey, Charles E., to Rohm and Haas Company. Permeable polymeric liner on absorbent pads. 4,069,366, Cl. 428-310.000.

Hoffmann, Heinz: *See*—
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Hoffmann-La Roche, Inc.: *See*—
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Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,069,229, Cl. 260-308.00R.
Mlodozeniec, Arthur Roman; and White, Lawrence Samuel, 4,069,084, Cl. 156-378.000.
Reif, Robert Bruce, 4,069,086, Cl. 156-378.000.

Hoffmann, Werner; and von Fraunberg, Karl, to BASF Aktiengesellschaft. Cyclopentene derivatives. 4,069,258, Cl. 260-598.000.

Holcombe, Cressie E., Jr. Eye cooler for sunbathers. 4,068,918, Cl. 350-3.000.

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Holy, Josef K.; and Henderson, Alan R., to Hughes Aircraft Company. Linear position measuring device. 4,068,384, Cl. 33-141.00F.

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Schmidt, Arnold; and Sybertz, Hans, 4,068,694, Cl. 144-230.000.

Homecrest Industries, Inc.: *See*—
Bottemiller, Merton M., 4,068,888, Cl. 297-317.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honda Motor Co., Ltd.: *See*—
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Honeywell Inc.: *See*—
Brown, Arthur W.; Goetz, Heinz E.; Morrow, Ronald J.; and Waldhauer, Charles H., Jr., 4,068,910, Cl. 339-18.00P.
Lorenze, Robert V., Jr.; and Young, Miriam F., 4,069,095, Cl. 156-632.000.

Honeywell Information Systems Inc.: *See*—
Kowalski, John Lawrence, 4,069,496, Cl. 357-70.000.
Tippetts, Kenneth Boyd, 4,068,767, Cl. 214-6.0BA.

Hoodis, Marvin. Corner bracket for frames. 4,068,967, Cl. 403-402.000.

Hooker Chemicals & Plastics Corporation: *See*—
Lin, Henry C., 4,069,263, Cl. 260-650.00R.
Lin, Henry C., 4,069,264, Cl. 260-650.00R.
Pattison, Victor A.; and Carr, Russell L. K., 4,069,340, Cl. 424-298.000.

Hooper, Bernard. Stepped piston two stroke engines. 4,068,629, Cl. 123-65.00S.

Hoover, Fred Wayne; and Roberts, Robert Earl, to Du Pont de Nemours, E. I., and Company. Ultrafiltration device. 4,069,157, Cl. 210-433.00M.

Hoover, Lonnie Daniel, to N L Industries, Inc. Suspension fertilizers and method of producing same. 4,069,034, Cl. 71-33.000.

Horgan, Stephen W.; Palopoli, Frank P.; and Schwoegler, Edward J., to Richardson-Merrell Inc. Process for preparing 2-(2,2-dicyclohexylethyl)piperidine. 4,069,222, Cl. 260-293.520.

Horikoshi, Akira; Sakamoto, Kenro; Koike, Toshihiko; Sadahiro, Yosuke; and Kato, Toyohiko, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive element sensitized with an inorganic bismuth compound and the use thereof. 4,069,051, Cl. 96-66.00R.

Horix Manufacturing Company: *See*—
Easter, William M., 4,068,450, Cl. 53-331.500.

Horn, Dieter. Writing-table and machine-table combination. 4,068,908, Cl. 312-30.000.

Horsfield, Arthur Kenneth: *See*—
Minoprio, William Edward; and Horsfield, Arthur Kenneth, 4,069,404, Cl. 200-60.000.

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Horvitz, David; and Baugh, William D., to National Distillers and Chemical Corporation. Manufacture of gamma-butyrolactones from 1,3-glycols and esters, halides and metadioxanes thereof. 4,069,232, Cl. 260-343.600.

Hosoi, Masaaki: *See*—
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Hounsfield, Godfrey Newbold, to E M I Limited. Apparatus for examining objects by means of penetrating radiation. 4,069,422, Cl. 250-445.00T.

Houston, John M.; Young, James R.; and Whetten, Nathan R., to General Electric Company. Photoemissive cathode and method of using comprising either cadmiumtelluride or cesium iodide. 4,069,438, Cl. 313-346.00R.

Howarth, John T.: *See*—
United States of America, National Aeronautics and Space Administration; Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A., 4,069,212, Cl. 260-77.5SP.

Howe, James D., to Bausch & Lomb Incorporated. Lighting panel having improved refracting elements. 4,069,417, Cl. 362-330.000.

Howell, Silas E., Jr. Material handling implement. 4,068,774, Cl. 214-766.000.

Huang, Wen H. Process for the extraction of aluminum from aluminum ores. 4,069,296, Cl. 423-127.000.

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Hudson, John William, to United States Steel Corporation. Process and apparatus for producing and using cold ammonia. 4,069,029, Cl. 62-51.000.

Hudson, Robert M.; Oles, Edward J., Jr.; and Warning, Clair John, to United States Steel Corporation. Method for improving the surface quality of annealed steel strip. 4,069,069, Cl. 148-12.100.

Hudson, Robert M.; Oles, Edward J., Jr.; and Warning, Clair J., to United States Steel Corporation. Method of producing low carbon tin-mill gage steel without annealing border. 4,069,070, Cl. 148-12.100.

Hudson, William Jeffrey, Jr.; and Bahermans, Johannes Cornelis Wilhelmus, to AMP Incorporated. Cable clamping insulation displacing electrical connector for multi-conductor flat flexible cable. 4,068,912, Cl. 339-99.00R.

Huffman, James Earle. Picker stick feed and sawing device. 4,068,549, Cl. 83-417.000.

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Farnsworth, Robert P., 4,069,449, Cl. 363-28.000.
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Humphrey, Frederick H.; and Jarvis, James J., to Metal-Cladding, Inc.

Expansible bottom structure for fiberglass reinforced plastic tanks. 4,068,777, Cl. 220-1.00B.
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Herrington, F. John; and Hungerford, Gordon P., 4,069,292, Cl. 264-40.300.
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Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Apparatus for coating wire on a spool. 4,068,617, Cl. 118-50.000.
Hurst, Robert Norman, to RCA Corporation. Arrangements for testing color television systems. 4,069,500, Cl. 358-10.000.
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Hutchison, Robert B.; and Blewett, C. William, to Emery Industries, Inc. Aluminum acyloxides. 4,069,236, Cl. 260-414.000.
Hutson, Thomas, Jr., to Phillips Petroleum Company. Oxidative dehydrogenation effluent control. 4,069,272, Cl. 260-680.00E.
Hutton, David Glenn; and Robertaccio, Francis Leonard, to Du Pont de Nemours, E. I., and Company. Industrial waste water treatment process. 4,069,148, Cl. 210-11.000.
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Iacono, Frederick Della; Trustman, Allen; and LeVine, Donald J., to Kings Electronics Company, Inc. Voltage tap. 4,068,916, Cl. 339-177.00R.
Ibbotson, Arthur, to Imperial Chemical Industries Limited. Polyesters and polyester-urethanes stabilized with isoureas or isocyanate adducts thereof. 4,069,198, Cl. 260-45.9KB.
Ichinohe, Eisuke, to Matsushita Electric Industrial Co., Ltd. Method of making a semiconductor device. 4,069,067, Cl. 148-1.500.
Icon American International, Inc.: *See—*
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IDL Incorporated: *See—*
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Iglesias, Jose J. Anti-arcing resectoscope. 4,068,667, Cl. 128-303.150.
Imada, Akira; Nozaki, Yukimasa; Hasegawa, Toru; and Yoneda, Masahiko, to Takeda Chemical Industries, Ltd. Method for producing antibiotic T-42082 and antibiotic T-42082. 4,069,316, Cl. 424-122.000.
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Imperial Chemical Industries Limited: *See—*
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Eaton, David Crawford; Nicholson, Benjamin Eric; and Williams, Barry, 4,069,380, Cl. 544-212.000.
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Beyer, Klaus D.; Das, Gobinda; Poponiak, Michael R.; and Yeh, Tsu-Hsing, 4,069,068, Cl. 148-1.500.
Bullock, Michael Kermit; Clay, Sherwood Anderson; and Overton, Gregory Bingham, 4,068,839, Cl. 271-180.000.
Cadwallader, Robert H.; Darves-Bornoz, Yves; Gasparri, Angelo S.; and Racine, Francis A., 4,068,994, Cl. 425-110.000.
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Fox, Sidney Jared, 4,069,486, Cl. 346-75.000.
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McGroddy, James Cleary; and Zory, Peter Stephen, Jr., 4,069,463, Cl. 331-94.50P.
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Becka, Michael M., 4,068,336, Cl. 12-14.400.
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Inukai, Takashi; Sato, Hideo; and Ishibe, Tetsuya, to Chisso Corporation. Liquid crystal composition. 4,069,167, Cl. 252-299.000.
Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Bis-heterocyclic benzoate ultraviolet stabilizers and their use in organic compositions. 4,069,227, Cl. 260-308.00R.
Irvin Disc, Incorporated: *See—*
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Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, to Nissan Motor Co., Ltd. Safety bag inflation apparatus with extendible guard member against contact of bag with heated gas generator. 4,068,862, Cl. 280-740.000.
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Iwamitu, Yasuyuki; Uchida, Yoshiaki; Kobayashi, Shigeru; and Tateno, Masamitu, to Tekken Construction Co., Ltd. Automatic tunnel face hydraulic pressure controlling apparatus in shield type hydraulic tunnel boring system. 4,068,484, Cl. 61-85.000.
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Jackson, Crowell B. Household and barbecue torch lighter. 4,069,006, Cl. 431-344.000.
Jackson, James Phillip, Jr.: *See—*
Bell, Terry Lee; Call, Lyle G.; Dillan, George Omer; Jackson, James Phillip, Jr.; and Johnson, Larry Albin, 4,068,373, Cl. 29-741.000.
Jackson, Melbourne L., to Idaho Research Foundation, Inc. Continuous fermentation process and apparatus. 4,069,149, Cl. 210-44.000.
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Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread supply device. 4,068,807, Cl. 242-47.010.
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Jenkinson, David Charles, to Comalco Aluminium (Bell Bay) Limited. Aluminum-silicon alloys, cylinder blocks and bores, and method of making same. 4,068,645, Cl. 123-193.00C.
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Johanson, Donald L.; and Chan, Thomas S., to United States Surgical Corporation. Modular in-the-ear hearing aid. 4,069,400, Cl. 179-107.00E.
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Johnson, Alexander Lawrence, to Du Pont de Nemours, E. I., and Company. 1-(2-Carboxyaryl)-3-aryl-1,2,4-triazoles and use as herbicides. 4,069,035, Cl. 71-76.000.
Johnson, Ben C.; and Band, Pieter, to Thermon Manufacturing Company. Mounting apparatus. 4,068,966, Cl. 403-397.000.
Johnson, Bennie R.; and Cox, Gary L. Handle hinge to transfer lifting force in a direction parallel and normal to mounting wall. 4,068,347, Cl. 16-112.000.
Johnson, Dennis L. Metered fuel injection apparatus. 4,068,641, Cl. 123-139.00A.
Johnson, George C.; and Schweizer, Albert E., to Mobil Oil Corporation. Phosphate ore recovery. 4,069,144, Cl. 209-11.000.
Johnson, Harvey C., Jr. Utility rack. 4,068,760, Cl. 211-74.000.
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Johnson, William R., to Peerless Portable Metal Building. Free standing fireplace stove. 4,068,649, Cl. 126-120.000.
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Hessert, James E.; Bertus, Brent J.; and Johnston, Chester C., Jr., 4,068,720, Cl. 166-282.000.
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Joice, Richard L. Universal bag-making machine. 4,068,566, Cl. 93-8.00R.
Jolivet, Jean-Claude; and Stouls, Francois-Xavier Antoine, to Societe Anonyme de Telecommunications. Digital transmission method for coded video signals. 4,069,504, Cl. 358-142.000.
Jones, Frederick L., to Monarch Marking Systems. Compositions and methods relating to transfer processes. 4,069,179, Cl. 260-23.00R.
Jones, Howard; Yang, Shu Shu; and Jacobus, David P., to Merck & Co., Inc. Blocked cholecalciferol and dihydrotachysterol 3 derivatives. 4,069,321, Cl. 424-236.000.
Joseloff, Stanley: *See*—
Bewerse, Richard A.; and Joseloff, Stanley, 4,068,451, Cl. 53-385.000.
Joshi, Kailash Chandra, to International Business Machines Corporation. Studded heat exchanger for integrated circuit package. 4,069,498, Cl. 357-81.000.
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, to Texas Instruments Incorporated. Transducer. 4,068,527, Cl. 73-704.000.
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Podolan, Edward G.; Przybysz, Francis C.; and Jozefczak, Thadius F., 4,068,407, Cl. 49-215.000.
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Kelsey, Christopher George, 4,068,476, Cl. 60-671.000.
Kablaoui, Mahmoud S.; Larkin, John M.; and Reid, Robert E., to Texaco Inc. Preparation of acylisoxazolines. 4,069,226, Cl. 260-307.00F.
Kabs, Klaus: *See*—
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Kakiuchi, Akio: *See*—
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Kalns, Arvids. Concrete slab forming machine. 4,068,990, Cl. 425-64.000.
Kaloi, Cyril M., to United States of America, Navy. Coupled fed magnetic microstrip dipole antenna. 4,069,483, Cl. 343-700.0MS.
Kamata, Shohichi; Kimura, Yoshinori; and Sakuragi, Johii, to Tokyo Shibaura Electric Co., Ltd. Foreground subject-identifying apparatus. 4,069,472, Cl. 340-146.30K.
Kamei, Siro; Takeda, Kenzo; Takahashi, Mitsunao; and Nakano, Jiro, to Nippon Crucible Co., Ltd.; Teikoku Kako Co., Ltd.; and Nippon Steel Corporation. Monolithic refractory materials. 4,069,057, Cl. 106-55.000.
Kamienski, Conrad W.; McElroy, Bobby Joe; and Bach, Ricardo O., to Lithium Corporation of America. Stable diorganomagnesium compositions. 4,069,267, Cl. 260-665.00R.
Kaminski, Perry W., to Texas Instruments Incorporated. Method of making pushbutton keyboard system. 4,068,369, Cl. 29-622.000.
Kamohara, Hideaki; Nakatui, Toji; Yoshitomi, Yuji; Sasaki, Iwao; and Shimada, Kenji, to Hitachi, Ltd. Tube expander. 4,068,372, Cl. 29-727.000.
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Kanai, Kazumichi; Kimura, Tetsuo; and Fukui, Akito, to Mitsui Toatsu Chemicals, Incorporated; and Toyo Engineering Corporation of Japan. Process for the production of water-free molten urea. 4,069,253, Cl. 260-555.00C.
Kanaida, Yoshio; Kataoka, Ryuji; and Imai, Kuniji, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine. 4,068,632, Cl. 123-117.00A.
Kanaoka, Masazumi; Ogawa, Daisuke; Iwayama, Kazuyoshi; and Kihara, Makoto, to Toray Industries, Inc. Adsorbent for aromatic hydrocarbon mixture separation. 4,069,172, Cl. 252-455.00Z.
Kaneko, Yasuhisa: *See*—
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Kansai Paint Company, Limited: *See*—
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Karlsson, Sven Arne Lennart. Apparatus enabling disabled persons to move independently. 4,068,857, Cl. 280-259.000.
Karna, John D.; Brock, Gregory K.; and Shellhammer, Daniel M., to Weyerhaeuser Company. Explosive gas monitoring method and apparatus. 4,069,018, Cl. 23-232.00E.
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Karp, Joel A.: *See*—
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Kasai, Masanao; Oikawa, Youko; Ito, Hiroshi; and Matsuno, Hiroshi, to Canon Kabushiki Kaisha. Recording member and process for recording. 4,069,487, Cl. 346-76.00L.
Kashiwa, Norio: *See*—
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Kauffman, William J.; and Quinn, Edwin J., to Armstrong Cork Company. Fire retardant polyisocyanurate and polyurethane foams having reduced smoke levels and method for producing same. 4,069,173, Cl. 260-2.5AJ.
Kawada, Seigo; Ohta, Nobuya; and Sakamoto, Akira, to Kumial Chemical Industry Co., Ltd. Agricultural germicidal composition. 4,069,335, Cl. 424-274.000.
Kawai, Masanori; and Kobayashi, Shinkichi, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal oscillator. 4,069,434, Cl. 310-348.000.
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Kelley Company, Inc.: *See—*
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Kelsey, Christopher George, to Brown, Andrew Graham; and K. E. Ellis Holdings Pty. Ltd. Solar driven power unit. 4,068,476, Cl. 60-671.000.
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Kenney, Harold E.; and Donahue, Edward T., to United States of America, Agriculture. Lubricant composition. 4,069,163, Cl. 252-46.700.
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Kidder, Raymond W. Method of making plastic optical fibers. 4,069,280, Cl. 264-1.000.
Kidoh, Kunizoh; Wakamori, Hideki; Asai, Genzo; and Kusida, Kazuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Densification of particulate porous fluorinated resins. 4,069,291, Cl. 264-342.00R.
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,318, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,323, Cl. 424-244.000.
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Kimmel, Richard L.; Kamp, Walter B.; and Aasgaard, Alvin L. P., III. Rotary cutting assembly. 4,068,377, Cl. 30-276.000.
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Klein, Howard Paul, to Texaco Development Corporation. Brominated ester-containing polyols. 4,069,207, Cl. 260-75.00H.
Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Preparation of phosphonic and/or phosphinic acids. 4,069,247, Cl. 260-502.40R.
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Knutsen, Tryggve Lund; and Osterman, Sven-Olof, to Astra Protein Products AB. Process for removing solvent from proteinaceous material. 4,068,388, Cl. 34-36.000.
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Kobzan, John, to Dacor Corporation. Constant volume buoyancy compensation system. 4,068,657, Cl. 128-142.00R.
Koester, Richard H., to Singer Company, The. Filmstrip cartridge with film lock. 4,068,809, Cl. 242-197.000.
Koester, Richard H.; and Hickey, Roy E., to Singer Company, The. Backlash free lens focusing apparatus. 4,068,935, Cl. 353-71.000.
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Kohorn, Alfred O. Knitting machine needle with front and back cut-outs and spring. 4,068,500, Cl. 66-123.000.

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Komoto, Robert G., to Chevron Research Company. Dimerization of linear alpha-olefins. 4,069,273, Cl. 260-683.15D.
Konig, Eberhard, to Bodenseewerk Perkin-Elmer & Co. GmbH. Method and apparatus for automatically performing series analyses. 4,068,529, Cl. 73-423.00A.
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Kopachkov, Slavco A., to Rothmans of Pall Mall Canada Limited. Machine for applying liquid to absorbent material. 4,068,614, Cl. 118-6.000.
Koppelman, Edward; and Murray, Robert G., to Koppelman, Edward. Continuous thermal reactor system and method. 4,069,107, Cl. 201-12.000.
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Krebs, Klaus, to hoechstmass Balzer GmbH & Co. Tape measure reel. 4,068,383, Cl. 33-138.000.
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Kullman, Thomas D., Jr., to Consolidated Packaging Corporation. Container with integral corner posts. 4,068,796, Cl. 229-49.000.
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Kidoh, Kunizoh; Wakamori, Hideki; Asai, Genzo; and Kusida, Kazuo, 4,069,291, Cl. 264-342.00R.
Nishita, Sadao; Enomoto, Satoru; Wada, Hisayuki; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,069,211, Cl. 260-77.5MA.
Kurita, Takaji: *See—*
Kushima, Teizo; Kurita, Takaji; and Mizunoe, Hiroaki, 4,068,936, Cl. 355-1.000.
Kurozu, Toshio; Yamada, Shinjiro; and Miyashita, Norio, to Mitsui Mining & Smelting Co., Ltd.; and Honda Motor Co., Ltd. Seat lock device. 4,068,890, Cl. 297-355.000.
Kusaba, Hideyuki: *See—*
Hara, Hiroshi; and Kusaba, Hideyuki, 4,069,050, Cl. 96-60.00R.
Kushima, Teizo; Kurita, Takaji; and Mizunoe, Hiroaki, to Minolta Camera Kabushiki Kaisha. Optical projection apparatus for image transfer type electrophotographic copiers. 4,068,936, Cl. 355-1.000.
Kusida, Kazuo: *See—*
Kidoh, Kunizoh; Wakamori, Hideki; Asai, Genzo; and Kusida, Kazuo, 4,069,291, Cl. 264-342.00R.
Kyo, Sunao; Hayashi, Katsuhiko; Tanaka, Hidetsugu; and Oka, Hideaki, to Kuraray Co., Ltd. Process for the production of polyhydric alcohols. 4,069,261, Cl. 260-635.00E.
L. D. Schreiber Cheese Company, Inc.: *See—*
Bush, Robert G., 4,069,348, Cl. 426-119.000.
Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Power paint blend of an epoxy and hydroxy-functional copolymer and an anhydride-functional copolymer. 4,069,275, Cl. 260-836.000.
Lai, San-Cheng, to Rockwell International Corporation. Method of electrochemically forming a lithium silicon iron alloy electrode. 4,069,111, Cl. 204-39.000.
Laliberte, Robert: *See—*
Chayer, Brigitte S., 4,068,321, Cl. 2-227.000.
Lamb, James O.: *See—*
Duff, Donald R.; Lamb, James O.; and Pezzolo, Donald E., 4,068,462, Cl. 58-23.0AC.
Lamos, Richard Allen, to International Business Machines Corporation. Paper hold-down device for collector. 4,068,837, Cl. 271-173.000.
Landi, Henry Patrick: *See—*
Meyers, Marion Douglas; and Landi, Henry Patrick, 4,068,928, Cl. 350-160.00R.
Landwehrkamp, Hans, to Schubert & Salzer. Open-end spinning device. 4,068,456, Cl. 57-58.890.
Lane, Noel W., Jr. Float tether terminator. 4,068,479, Cl. 61-5.000.
Lang, Armin; and Fassbender, Rolf, to Zahnradfabrik Friedrichshafen AG. Valve for hydraulic systems. 4,068,678, Cl. 137-100.000.
Langbein, Adolf; Merz, Herbert; Walther, Gerhard; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing an N-(furyl-methyl)-2'-hydroxy-5,9,9-trimethyl benzomorphan and method of use. 4,069,328, Cl. 424-266.000.
Langbein, Adolf; Danneberg, Peter; and Kuhn, Franz Josef, to Boehringer Ingelheim GmbH. N-(p-fluorobenzoyl-n-propyl)-4-piperidylamides and salts thereof. 4,069,331, Cl. 424-267.000.
Lange, Daniel J., to P. D. George Company, The. Imino acids and resins derived therefrom. 4,069,209, Cl. 260-75.00N.
Lange, Fritz-Walter; Jacobi, Haireddin; and Muller, Jens, to Chemisches Laboratorium Fritz-Walter Lange GmbH & Co KG. (2-Oxopyrrolidines)-acetic hydrazides. 4,069,336, Cl. 424-274.000.
Langguth, Harvard H. Machine for uprooting tree stumps and trees. 4,068,396, Cl. 37-2.00R.
Langhauser, Wolfgang: *See—*
Gey, Werner; Langhauser, Wolfgang; Heinze, Helmut; Rothe, Hans-Joachim; and Freund, Peter, 4,069,194, Cl. 260-40.00R.
Langreney, Francois. Apparatus for the continuous crystallization of sugar. 4,069,065, Cl. 127-15.000.
Laniel, Joseph M.: *See—*
Montjallard, Paul Rene; Laniel, Joseph M.; and Gay-Chatain, Guillaume A., 4,068,557, Cl. 89-33.00E.
Lanoie, Paul Emile. Apparatus for producing pieces of eggs. 4,068,570, Cl. 99-353.000.
Lantzsch, Reinhard; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for preparing 2-acetyl-3-methyl-1,3-butadiene. 4,069,257, Cl. 260-595.000.
Lapp, Robert: *See—*
Olsen, Samuel R.; and Lapp, Robert, 4,068,565, Cl. 93-1.100.
Larkin, John M.: *See—*
Kablaoui, Mahmoud S.; Larkin, John M.; and Reid, Robert E., 4,069,226, Cl. 260-307.00F.
Larko, Robert C.: *See—*
Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., 4,069,007, Cl. 432-3.000.

Lasko, John A. Pipe joint. 4,068,863, Cl. 285-39.000.

Lauck, Helmut, to Varta Batterie Aktiengesellschaft. Manufacture of galvanic elements having lithium or calcium electrodes. 4,069,375, Cl. 429-218.000.

Lauder, Brian Tait; and Rolfe, John Robert Kenneth, to British Petroleum Company Limited, The. Hydrocarbon separating process. 4,069,142, Cl. 208-310.00Z.

Laurent, Daniel; and Felten, Alain, to Secmer S.A. Head for mixing and discharging at least two ingredients. 4,068,829, Cl. 366-177.000.

Lavenu, Jean Claude: *See—*
Dubois, Jean Claude; Gazard, Maryse; Duchesne, Claude; and Lavenu, Jean Claude, 4,068,919, Cl. 350-96.0WG.

Lawrence, Bryan, to Deciduous Fruit Board, The. Container particularly, but not exclusively for use in shipping perishables. 4,068,794, Cl. 229-23.00R.

Layer, Robert Wesley; and Son, Pyong-Nae, to B.F. Goodrich Company, The. Substituted decahydroquinolines and their use as ultraviolet light stabilizer. 4,069,195, Cl. 260-45.8NW.

Le Joint Francais: *See—*
Anglade, Jacques, 4,068,852, Cl. 277-34.300.

Leather, Richard B. Boat conversion device. 4,068,611, Cl. 115-24.100.

Leatherman, I. Roger; and Misura, Michael S., to PPG Industries, Inc. Tungsten hexacarbonyl in plastic lenses. 4,069,168, Cl. 252-300.000.

Leddy, Jerome R. Automotive ignition tool. 4,068,647, Cl. 123-198.00R.

Ledesma, Thomas. Athletic knee guard. 4,068,312, Cl. 2-24.000.

Lee, J. Spencer, to Santa Barbara Research Center. Feedback capacitor divider. 4,069,459, Cl. 330-107.000.

Leeves, Geoffrey Gordon, to Pandrol Limited. Driving of rail clips in making a railway rail-and-fastening assembly. 4,068,593, Cl. 104-1.00R.

Lefebvre, Pascal, to Automobiles Peugeot. Device for controlling accessories driven by the engine of a vehicle having an assisted steering. 4,068,477, Cl. 60-698.000.

Lefever, Kenneth Winans. Liquid storage systems. 4,068,480, Cl. 61-0.500.

Le Fustec, Richard: *See—*
Aboulafia, Joseph; Le Fustec, Richard; and Schranz, Claude, 4,069,287, Cl. 264-140.000.

Legler, George, to Precision Mfg Inc-Fabrication Precision Inv. Divider screen. 4,068,700, Cl. 160-351.000.

Le Guelennec, Emile. Manure crushing and earth mixing rotary machine. 4,068,722, Cl. 172-123.000.

Lehman, Albert L., to A. Finkl & Sons Co. Method for desulfurization using arc heat under vacuum. 4,069,039, Cl. 75-12.000.

Leibundgut, Max, to Alos AG. Microfilm viewer having enlarged copy production attachment. 4,068,944, Cl. 355-45.000.

Leichle, Claude: *See—*
Lombard, Claude; and Leichle, Claude, 4,068,631, Cl. 123-117.00D.

Lelke, Helmut, to Raytheon Company. Digital bit image memory system. 4,069,511, Cl. 364-200.000.

Lemkey, Franklin D.; and Golden, Gerald S., to United Technologies Corporation. Metallic fibrous skeletal catalysts and process for producing them. 4,069,171, Cl. 252-454.000.

LeNir, Victor Louis, to Northern Telecom Limited. Control for wire coating line. 4,068,615, Cl. 118-6.000.

Lenz, Leonard L., to American Mobile Corporation. Safety device for mobile work platform lift. 4,068,737, Cl. 182-63.000.

LeRoy, Pierre L., to New Research and Development Lab., Inc. Surgical retractor and sponge carrying assembly. 4,068,655, Cl. 128-20.000.

Leutheuser, Harold H., to Alson's Corporation. Pulsating jet spray head. 4,068,801, Cl. 239-102.000.

Levaillant, Claude: *See—*
Bensussan, Andre; and Levaillant, Claude, 4,069,456, Cl. 328-165.000.

LeVine, Donald J.: *See—*
Iacono, Frederick Della; Trustman, Allen; and LeVine, Donald J., 4,068,916, Cl. 339-177.00R.

Levy, Albert: *See—*
Canard, Pierre; and Levy, Albert, 4,069,188, Cl. 260-29.70T.

Lewis, Richard; and Parker, Michael J., to British Steel Corporation. Ultrasonic inspection of articles. 4,068,524, Cl. 73-598.000.

Lewis, Richard: *See—*
Hetherington, Matthew J.; Lewis, Richard; and Goode, Graham E., 4,068,523, Cl. 73-628.000.

Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., to Argus Chemical Corporation. Thermally stable high molecular weight acyl peroxycarbonic esters. 4,069,239, Cl. 260-463.000.

Licata, Bernard M.: *See—*
Bacon, David C., 4,068,465, Cl. 58-50.00R.

Lichti, Robert D., to CraneVeyor Corporation. Shaft coupling. 4,068,965, Cl. 403-313.000.

Lichtman, Allan S.; and Lichtman, Rosemary R. Professional malpractice board game apparatus. 4,068,848, Cl. 273-257.000.

Lichtman, Rosemary R.: *See—*
Lichtman, Allan S.; and Lichtman, Rosemary R., 4,068,848, Cl. 273-257.000.

Liebetanz, Erich, deceased: *See—*
Mannsfeld, Sven Peter; Pfeiffer, Arno; Tanner, Herbert; Wagner, Hans; and Liebetanz, Erich, deceased, 4,069,251, Cl. 260-534.00S.

Liebetanz, Eva Angela, heiress: *See—*
Mannsfeld, Sven Peter; Pfeiffer, Arno; Tanner, Herbert; Wagner, Hans; and Liebetanz, Erich, deceased, 4,069,251, Cl. 260-534.00S.

Lillethorup, Ben W., to Reynolds Metals Company. Framing joint construction and clip therefor. 4,068,440, Cl. 52-301.000.

Lin, Henry C., to Hooker Chemicals & Plastics Corporation. Process for directed chlorination of alkylbenzenes. 4,069,263, Cl. 260-650.00R.

Lin, Henry C., to Hooker Chemicals & Plastics Corporation. Process for directed chlorination of alkylbenzenes. 4,069,264, Cl. 260-650.00R.

Lin, Luke C.; and Schrager, Morton, to Xerox Corporation. Transfer of photoelectrophoretic images. 4,069,047, Cl. 96-1.400.

Linner, Hans Rolf Ingemar, to AB Akerlund & Rausing. Carton sealing strip applicator. 4,069,093, Cl. 156-522.000.

Lionetti, Thomas A.; Miller, Kenneth D.; and Parker, Levi C., to Texaco Inc. Process for recovering fuel oil from topped crude. 4,069,141, Cl. 208-309.000.

Liston, Kenneth D., Jr.: *See—*
Lukkarila, Jeffrey Reed; and Liston, Kenneth D., Jr., 4,068,847, Cl. 273-85.00R.

Lithium Corporation of America: *See—*
Kamienski, Conrad W.; McElroy, Bobby Joe; and Bach, Ricardo O., 4,069,267, Cl. 260-665.00R.

Little, Joseph P., Jr., to Caterpillar Tractor Co. Fuel ratio control with manually operated air override. 4,068,642, Cl. 123-140.0MP.

Loctite Corporation: *See—*
DeMarco, JoAnn, 4,069,378, Cl. 526-328.000.

Lodato, Alphonso; Cornacchio, Americo; and Fox, Edward M., to Kings Electronics Company, Inc. Washer and connector assembly. 4,068,911, Cl. 339-90.00R.

Lodholz, John C.; and Straus, P. Barry, to FMC Corporation. Control device for dual flow clarifiers. 4,069,150, Cl. 210-112.000.

Loeber, Frederick W.; and Russo, Louis, to Ameron, Inc. Rear stepper assembly for a pipe handling vehicle. 4,068,764, Cl. 214-1.0PA.

Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. 3-Carbalkoxyamino-1H-2,1,4-benzothiadiazine derivatives. 4,069,325, Cl. 424-246.000.

Loewenthal, Horst, to SIG Schweizerische Industrie-Gesellschaft. Conveyor with endless chain. 4,068,756, Cl. 198-653.000.

Lohmer, Karl; von Konig, Anita; Schutz, Siegismund; and Stoltefuss, Jurgen, to AGFA-Gevaert Aktiengesellschaft. Color photographic materials with spiro heterocyclic stabilizing agents comprising 2-imidazolidine-4',5'-dione rings. 4,069,052, Cl. 96-76.00R.

Lombard, Claude; and Leichle, Claude, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Internal combustion engine electronic ignition control system. 4,068,631, Cl. 123-117.00D.

Long, Robert A. Vapor recovery liquid dispensing apparatus. 4,068,687, Cl. 141-59.000.

Lonseth, Palmer; Panter, Hubert Gerald; and Moorby, Donald G., to Canadian General Electric Company. Apparatus for injecting elastomeric material. 4,068,691, Cl. 141-284.000.

Loomba, Yogendra S.; and Narayan, Surendra D., to Allied Chemical Corporation. Safety belt buckle. 4,068,354, Cl. 24-230.00A.

Loos, Herbert, to Carl Hurth Maschinen- und Zahnradfabrik. Device for deburring or chamfering of the face edges of gears. 4,068,558, Cl. 90-1.60A.

Lorenze, Robert V., Jr.; and Young, Miriam F., to Honeywell Inc. Method of preparing photodetector array elements. 4,069,095, Cl. 156-632.000.

Lorie, Mario A.: *See—*
White, William H.; and Lorie, Mario A., 4,069,429, Cl. 307-265.000.

Losert, Gerhard K., to General Electric Company. Self locking support mechanism. 4,068,815, Cl. 248-188.200.

Lower, William E., to Rotex, Inc. Distribution of feed onto a screening machine. 4,069,146, Cl. 209-254.000.

Lubowski, Stanley J.; and Swank, Robert K., to General Electric Company. Process of making structured x-ray phosphor screen. 4,069,355, Cl. 427-70.000.

Lucas Industries Limited: *See—*
Dockerill, Ian Anthony, 4,068,518, Cl. 72-354.000.
Orloff, George; Munnoch, Peter Ian; and Thomas, Alan, 4,068,560, Cl. 91-36.000.

Luke, Johannes; Muth, Willy; Riederer, Wolfgang; and Wenzel, Gunter, to Hoechst Aktiengesellschaft. Apparatus for welding articles of thermoplasts. 4,069,087, Cl. 156-391.000.

Lukkarila, Jeffrey Reed; and Liston, Kenneth D., Jr., to Magnavox Company, The. Chroma and luminance signal generator for video games. 4,068,847, Cl. 273-85.00R.

Lundgren, Bengt G. S., to SKF Nova AB. Metal powder suited for powder metallurgical purposes, and a process for manufacturing the metal powder. 4,069,045, Cl. 75-251.000.

Luther, Gerhard, to Berliner Maschinenbau-AG vormals L. Schwartzkopff. Machine for air-jet texturizing of continuous synthetic filaments. 4,068,358, Cl. 28-272.000.

Luzzi, John J.: *See—*
Ramey, Chester E.; and Luzzi, John J., 4,069,196, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,069,199, Cl. 260-45.75C.

Lvovich, Galperin Aleksandr: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, 4,068,685, Cl. 139-188.00R.

M.A.T. Industries, Inc.: *See—*
Amoroso, Michael J., 4,068,897, Cl. 299-91.000.

M & T Chemicals Inc.: *See—*
Harbulak, Edward P., 4,069,112, Cl. 204-43.00T.

M & W Gear Company: *See—*
Meiners, Elmo R., 4,068,612, Cl. 115-76.000.

Maben, James W., to Sanders Associates, Inc. Tone address decoder for pager. 4,069,477, Cl. 340-311.000.

MacFarland, Charles H.: *See*—
Scott, Ernest R.; and MacFarland, Charles H., 4,068,341, Cl. 15-339.000.
Machacek, Frantisek; Bezemek, Vladislav; Kudlacek, Dusan; Kliment, Lubomir; Pirek, Arnost; Smejkal, Vladimir; Svoboda, Frantisek; and Vach, Stanislav, to Vyzkumny ustav pletarsky. Method of producing knitted slacks. 4,068,320, Cl. 2-227.000.
Machado, Octavio J.: *See*—
Berringer, Robert T.; and Machado, Octavio J., 4,069,102, Cl. 176-87.000.
Machida, Yasuhiko: *See*—
Yamadaya, Tokio; and Machida, Yasuhiko, 4,069,303, Cl. 423-644.000.
Mack, Jules A. Connector device for telephone terminals or housings. 4,068,914, Cl. 339-143.00R.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, to Pennwalt Corporation. Polymerization of ethylenically unsaturated monomers employing secondary-aliphatic α-substituted azoalkanes. 4,069,377, Cl. 526-218.000.
MacMillan, Kenneth T. Mold for applying pre-cured tread rubber to a tire, preferably utilizing a rubber envelope. 4,069,089, Cl. 156-394.000.
Macmillan, William Robertson, to Tilghman Wheelabrator Limited. Blast impellor wheels. 4,069,025, Cl. 51-434.000.
Macpherson, Roger. Double parallelogram jack. 4,068,825, Cl. 254-124.000.
Madate, Haruhisa: *See*—
Ohta, Shinichi; Matsumura, Isao; Kobayashi, Kazunobu; and Madate, Haruhisa, 4,068,932, Cl. 351-7.000.
Madfis, Alfred W. Rainwater run-off dispersion system. 4,068,424, Cl. 52-94.000.
Maeda, Hidetoshi; and Sasaki, Takehiko, to Sharp Kabushiki Kaisha. Reference signal frequency correction in an electronic timepiece. 4,068,463, Cl. 58-23.0AC.
Magee, Thomas A., to Diamond Shamrock Corporation. Method for regulating rests using alkylthiotrichlorodicyanobenzenes. 4,069,342, Cl. 424-304.000.
Mages, Bernhard: *See*—
Rock, Erich; and Mages, Bernhard, 4,068,349, Cl. 16-131.000.
Magnavox Company, The: *See*—
Lukkarila, Jeffrey Reed; and Liston, Kenneth D., Jr., 4,068,847, Cl. 273-85.00R.
Magnetic Separation Systems, Inc.: *See*—
Sommer, Edward J., Jr.; and Kenny, Garry R., 4,069,145, Cl. 209-212.000.
Mahler, Walter, to Du Pont de Nemours, E. I., and Company. Thermal stabilization of chlorobenzenes. 4,068,706, Cl. 165-1.000.
Maier, Erwin, to Wilhelm Maier & Sohne UNITAS-Maschinenfabrik. Skirt marker and shaping device. 4,068,783, Cl. 223-1.100.
Mailloux, Louis D., to Xerox Corporation. Color transparency reproducing machine. 4,068,939, Cl. 355-4.000.
Mainsuradze, Venera Romanovna: *See*—
Dzhaparidze, Levan Nikolaevich; Chakhunashvili, Temuri Alexandrovich; Mainsuradze, Venera Romanovna; Chagunava, Raul Vladimirovich; Kervalishvili, Zurab Yasonovich; Sikharulidze, Nodar Georgievich; Otiashvili, Dali Georgievna; Dubov, Yauzhe Markovich; Bogdanov, Eduard Alimovich; Gogoladze, Georgy Trofimovich; Teisheva, Alla Abelevna; Ryzygraeva, Galina Nikolaevna; Melnikov-Eikhenvald, Mikhail Alexeevich; and Rokva, Temuri Valeryanovich, 4,069,116, Cl. 204-96.000.
Malewicki, Douglas J. Combination motorcycle and hang-glider. 4,068,810, Cl. 244-2.000.
Malkina, Vera Matveevna: *See*—
Podkletnov, Evgeny Nikolaevich, deceased; Malkina, Vera Matveevna; and Podkletnov, Evgeny Evgenievich, administrators, 4,068,621, Cl. 118-620.000.
Mallinckrodt, Inc.: *See*—
Wiegert, Philip E., 4,069,250, Cl. 260-519.000.
Malpass, Dennis B.: *See*—
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,069,260, Cl. 260-632.00B.
Maltese, John: *See*—
Graham, Thomas G.; Maltese, John; Nesson, Israel; and Mitchell, Robert, 4,069,490, Cl. 354-83.000.
Malz, Russell E., Jr.; and Greenfield, Harold, to Uniroyal, Inc. Nuclear hydrogenation of n-aryl carbamates. 4,069,240, Cl. 560-115.000.
Manabe, Masami: *See*—
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,068,633, Cl. 123-117.00A.
Manders, Lambertus Wilhelmus Johannes: *See*—
Wanmaker, Willem Lambertus, deceased; Manders, Lambertus Wilhelmus Johannes; and ter Vrugt, Johannes Wilhelmus, 4,069,441, Cl. 313-487.000.
Mandy, Zoltan A., to Frick Company. Blade-type rotary compressor with full unloading and oil sealed interfaces. 4,068,981, Cl. 417-310.000.
Mangus, James D., to Westinghouse Electric Corporation. Self-compensating level control for sump suction pumps. 4,069,101, Cl. 176-65.000.
Mannara, Giuseppe, to Colgate Palmolive Company. Oral dentifrice containing uniform particles of speckling material. 4,069,311, Cl. 424-49.000.
Mannara, Giuseppe, to Colgate Palmolive Company. Uniform particles of speckling material for incorporation in oral dentrifices. 4,069,312, Cl. 424-49.000.
Mannsfeld, Sven Peter; Pfeiffer, Arno; Tanner, Herbert; Wagner, Hans; and Liebetanz, Erich, deceased (by Liebetanz, Eva Angela, heiress), to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Continuous process for the manufacture of methionine. 4,069,251, Cl. 260-534.00S.
Manos, Philip, to Du Pont de Nemours, E. I., and Company. Solvent drying of cellulose ester membranes. 4,068,387, Cl. 34-9.000.
Mantovani, Pietro; and Roldi, Silvio, to Societe Italiana Telecomunicazioni Siemens S.p.A. Remote-testing arrangement for PCM transmission system. 4,069,402, Cl. 179-175.31R.
Marcus, Konrad H., to Prince Corporation. Visor assembly and covered vanity mirror. 4,068,930, Cl. 350-277.000.
Marcy Gymnasium Equipment Co.: *See*—
Pierce, James E.; and Goodwin, Max E., 4,068,889, Cl. 297-352.000.
Marder, Milton David; Osmalov, Robert; and Pfeiffer, Gerald P., to Du Pont de Nemours, E. I., and Company. Process for finishing a nonwoven film-fibril sheet. 4,069,078, Cl. 156-181.000.
Marek, Miroslav; Toman, Ludek; and Pecka, Jan, to Ceskoslovenska akademie ved. Method for controlled radiation polymerization of olefinic monomers. 4,069,124, Cl. 204-159.240.
Marek, Miroslav; Toman, Ludek; and Pecka, Jan, to Ceskoslovenska akademie ved. Method for controlled radiation polymerization of olefinic monomors. 4,069,125, Cl. 204-159.240.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 4,069,201, Cl. 260-45.95R.
Markert, Matthew Edward, to Bendix Corporation, The. Floatation and anchoring mechanism for disc brake. 4,068,744, Cl. 188-73.300.
Markle, David A.: *See*—
Buckley, Jere D.; Markle, David A.; Newell, William H.; and Offner, Abe, 4,068,947, Cl. 355-72.000.
Marovich, John M. Frameless shelter for sunlit enclosures such as greenhouses, solariums and pool shelters. 4,068,421, Cl. 52-80.000.
Marsh, Edwin R. Simplified greenhouse structure suitable for mass production and field assembly. 4,068,423, Cl. 52-86.000.
Marsh, Ronald W.; and Newbury, Grant M., to Pullman Incorporated. Folding table construction. 4,068,601, Cl. 108-134.000.
Marshall, Robert: *See*—
Kouchich, Allan V.; and Marshall, Robert, 4,069,465, Cl. 338-20.000.
Marshall and Williams Company: *See*—
Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, 4,068,356, Cl. 26-91.000.
Martan, Michael, to UOP Inc. Preparation of acrylamide. 4,069,255, Cl. 260-561.00N.
Martin, Bart G., to Coin Acceptors, Inc. Interacting coin-blockout units for a preferred loading of coin tubes. 4,068,752, Cl. 194-1.00H.
Martin, Ronald L.; and Arnold, Richard C., to United States of America, Energy. High-energy accelerator for beams of heavy ions. 4,069,457, Cl. 328-235.000.
Martin, Thomas B.; Herscher, Marvin B.; and Cox, Robert B., to Threshold Technology, Inc. Word recognition apparatus and method. 4,069,393, Cl. 179-1.0SD.
Martin, Van Clifton, to International Business Machines Corporation. Bidirectional ink jet printer with moving record receiver. 4,069,485, Cl. 346-75.000.
Martinez, Joseph C.: *See*—
Zehrung, Claude D., Jr.; Urie, Clarence L.; and Martinez, Joseph C., 4,068,455, Cl. 56-344.000.
Marulic, Walter J.; and Ferris, Ray L., to Pullman Incorporated. Railway car door locking mechanism. 4,068,410, Cl. 49-370.000.
Maruyama, Kenjiro; Miki, Tsuyoshi; Nishi, Yoshiyuki; and Takao, Masato, to Sumitomo Bakelite Company Limited. Flexible matting. 4,068,339, Cl. 15-215.000.
Maruyama, Noboru: *See*—
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takai, Kiyoshi; and Maruyama, Noboru, 4,069,295, Cl. 423-49.000.
Maruyama, Tadaaki. Coupler. 4,068,869, Cl. 285-316.000.
Marvel, Carl S.; and Wong, Daniel Ting-Man, to University Patents, Inc. Cyclic tri(phenylene disulfide) polymers and the production thereof. 4,069,205, Cl. 260-49.000.
Marvin Glass & Associates: *See*—
Kuna, Wayne A.; Kulesza, Ralph J.; and Barlow, Gordon A., 4,068,841, Cl. 272-8.00R.
Masaharu, Yosimura, to Oki Electric Industry Company, Ltd. System for collecting information in water. 4,069,469, Cl. 340-5.00R.
Masaki, Kenji, to Nissan Motor Co., Ltd. Air-fuel mixture distribution system for multi-cylinder internal combustion engine. 4,068,473, Cl. 60-282.000.
Masella, Anthony J.: *See*—
Abrams, Edward; and Masella, Anthony J., 4,069,147, Cl. 210-6.000.
Maskin A/S K. Lund & Co.: *See*—
Rokholt, Jorgen, 4,069,115, Cl. 204-67.000.
Mason, Donald G., to Ecodyne Corporation. Sewage treatment system. 4,069,156, Cl. 210-195.00S.
Massachusetts Institute of Technology: *See*—
Masubuchi, Koichi; and Tsai, Chon-Liang, 4,069,408, Cl. 219-72.000.
Masse, Jean-Pierre. Collapsible shelter. 4,068,418, Cl. 52-2.000.
Massey-Ferguson Inc.: *See*—
Beckerman, Joseph W., 4,068,540, Cl. 74-476.000.
Massey-Ferguson Services N.V.: *See*—
Nolte, Gert; and Dittberner, Wolfgang, 4,068,899, Cl. 303-6.00A.
Massucco, Arthur A.: *See*—
United States of America, National Aeronautics and Space Administration; Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A., 4,069,212, Cl. 260-77.5SP.

Masubuchi, Koichi; and Tsai, Chon-Liang, to Massachusetts Institute of Technology. Method and apparatus for underwater submerged arc welding. 4,069,408, Cl. 219-72.000.

Masuda, Kenzo, to Hitachi, Ltd. MIS logic circuit of ratioless type. 4,069,427, Cl. 307-205.000.

Masuda, Kenzo, to Hitachi, Ltd. MIS switching circuit capable of enduring high voltage. 4,069,430, Cl. 307-270.000.

Masudaya Toy Company Limited: *See—*
Saito, Shigeru, 4,068,401, Cl. 46-92.000.

Masunaga, Midori; Kohno, Yoshiki; and Hayashi, Kohji, to Nippon Oil Company, Ltd. Electrical insulating oils. 4,069,165, Cl. 252-63.000.

Masunaga, Midori; Kohno, Yoshiki; and Hasegawa, Hiroshi, to Nippon Oil Company, Ltd. Electrical insulating oils. 4,069,166, Cl. 252-63.000.

Masuoka, Fujio, to Tokyo Shibaura Electric Co., Ltd. Semiconductor device for integrated injection logic. 4,069,495, Cl. 357-46.000.

Mathbirk Limited: *See—*
Matthews, Denis, 4,068,605, Cl. 112-223.000.

Mathis, Ronald D.; and Dix, James S., to Phillips Fibers Corporation. Dyeable polyamides containing an antistatic agent. 4,069,277, Cl. 260-857.0PG.

Matsuda, Motonobu, to Minolta Camera Kabushiki Kaisha. Automatic exposure control devices using bi-directional transistors. 4,069,489, Cl. 354-51.000.

Matsukawa, Hiroharu; and Hayashi, Takao, to Fuji Photo Film Co., Ltd. Process for producing developer sheet for pressure-sensitive recording paper. 4,069,353, Cl. 427-57.000.

Matsumoto, Ikuo: *See—*
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Hosoi, Masaaki; and Aoki, Nobuo, 4,069,254, Cl. 260-556.0AR.

Matsumura, Isao: *See—*
Ohta, Shinichi; Matsumura, Isao; Kobayashi, Kazunobu; and Madate, Haruhisa, 4,068,932, Cl. 351-7.000.

Matsumura, Yoshihiko: *See—*
Tsujimoto, Yasuhiro; Azuma, Junichi; Matsumura, Yoshihiko; and Noda, Katsumi, 4,069,155, Cl. 210-195.00R.

Matsuno, Hiroshi: *See—*
Kasai, Masanao; Oikawa, Youko; Ito, Hiroshi; and Matsuno, Hiroshi, 4,069,487, Cl. 346-76.00L.

Matsuoka, Kimiaki: *See—*
Komatsu, Tadaaki; Takeda, Hirokazu; Oshio, Hideki; Matsuoka, Kimiaki; and Aramaki, Minoru, 4,069,266, Cl. 260-653.000.

Matsushita Electric Industrial Company: *See—*
Yamadaya, Tokio; and Machida, Yasuhiko, 4,069,303, Cl. 423-644.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ichinohe, Eisuke, 4,069,067, Cl. 148-1.500.
Nagaoka, Tadashi, 4,069,503, Cl. 358-128.000.
Takeda, Takeshi; Muramatsu, Fumio; and Watanabe, Akinori, 4,069,440, Cl. 313-465.000.

Matthews, Denis, to Mathbirk Limited. Needles. 4,068,605, Cl. 112-223.000.

Matuura, Akira: *See—*
Morooka, Shigeaki; Tamoto, Katsumi; and Matuura, Akira, 4,069,230, Cl. 260-319.100.

Maximov, Gennady Konstantinovich: *See—*
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,068,459, Cl. 57-156.000.

Mayama, Masayoshi; Kobayashi, Tohru; and Tamura, Masahide, to Konishiroku Photo Industry Co., Ltd. Photographic films. 4,069,053, Cl. 96-87.00A.

Mayer, Ernest F.: *See—*
Barnett, James V., II; Mayer, Ernest F.; Pfeiffer, James W.; and Wickwar, Larry D., 4,068,464, Cl. 58-50.00R.

Mayr, Anton J.: *See—*
Baum, Sidney J.; and Mayr, Anton J., 4,068,616, Cl. 118-8.000.

Mays, Byron L.: *See—*
Allison, Arthur F.; Christopherson, Dennis C.; Mays, Byron L.; and Reed, Reginald A., 4,068,567, Cl. 93-93.00C.

McCabe, Peter: *See—*
Anbergen, Henricus J.; and McCabe, Peter, 4,068,838, Cl. 271-173.000.

McCarthy, James H. Apparatus for supporting and displaying plants. 4,068,761, Cl. 211-134.000.

McCarthy, Justin P.; Schlossman, Mitchell L.; and Mores, Lee R., to Emery Industries, Inc. Compositions of quaternary ammonium derivatives of lanolin acids. 4,069,347, Cl. 424-358.000.

McCarty, Leslie P., to Dow Chemical Company, The. Compositions and methods for anesthetizing an animal using deuterated analogues of halothane and chloroform. 4,069,346, Cl. 424-350.000.

McCoy, Horace S. Fishing device. 4,068,400, Cl. 43-53.500.

McCray, Peter M.: *See—*
Parker, Clarence B.; McCray, Peter M.; and Taylor, L. Lamoyne, 4,069,482, Cl. 343-7.700.

McDonald, Charles H. Elastomeric pavement repair composition. 4,069,182, Cl. 260-28.5AS.

McDonald, William R.: *See—*
Difley, Charles R.; Johnson, Milton J.; and McDonald, William R., 4,068,575, Cl. 100-45.000.

McDonnell Douglas Corporation: *See—*
Boehringer, Wilfred E., 4,068,770, Cl. 214-85.000.
Goldsworthy, William B.; and Karlson, Harald E., 4,068,357, Cl. 28-101.000.

McDonough, William J.; and Rice, Roy W., to United States of America, Navy. Silicon nitride-zirconium silicate ceramics. 4,069,059, Cl. 106-57.000.

McElroy, Bobby Joe: *See—*
Kamienski, Conrad W.; McElroy, Bobby Joe; and Bach, Ricardo O., 4,069,267, Cl. 260-665.00R.

McGroddy, James Cleary; and Zory, Peter Stephen, Jr., to International Business Machines Corporation. Injection laser array. 4,069,463, Cl. 331-94.50P.

McGuire, John S., to UOP Inc. Plastic well screen. 4,068,713, Cl. 166-233.000.

McIlrath, William P., to Racine Railroad Products, Inc. Rail cutting apparatus. 4,068,415, Cl. 51-178.000.

McKechnie, Ian C. Multiple spark ignition system. 4,068,643, Cl. 123-148.0CA.

McLay, William J.: *See—*
Aronoff, Edward I.; and McLay, William J., 4,068,501, Cl. 68-19.100.

McMahon, David Gue: *See—*
Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, 4,069,120, Cl. 204-129.000.

McMahon, Thomas R.: *See—*
Bass, Michael; Garmire, Elsa; and McMahon, Thomas R., 4,068,920, Cl. 350-96.0WG.

McMahon, William P. Wrist band containing an antislip composition. 4,068,318, Cl. 2-170.000.

McNair, Hugh Noel; and Olson, Stuart William, to Hydro Mix, Inc. Liquid proportioning device. 4,068,681, Cl. 137-588.000.

McNeill, Walter W., to Bundy Corporation. Universal coil carrier. 4,068,971, Cl. 294-67.00R.

McShane, James L., to Westinghouse Electric Corporation. Modular transducer assembly. 4,069,433, Cl. 310-325.000.

Meadow, Morton, to FMC Corporation. Purification of sulfur. 4,069,302, Cl. 423-575.000.

Meckley, Richard Allan: *See—*
Byxbe, Morley Ben; Meckley, Richard Allan; and Porter, William Hunt, 4,068,437, Cl. 52-464.000.

Mefina S.A.: *See—*
Beuchat, Roger, 4,068,592, Cl. 102-70.20R.

Mehrhof, Werner: *See—*
Schacht, Erich; Mehrhof, Werner; Kayser, Detlev; and Simane, Zdenek, 4,069,338, Cl. 424-274.000.

Meinders, Gerardus J., to Allis-Chalmers Corporation. Closing resistor switch for gas insulated circuit breaker. 4,069,406, Cl. 200-144.0AP.

Meinecke, Steven L.; and Saunders, Walter Selden, to Saunders, Walter Selden. Wind deflector configuration. 4,068,883, Cl. 296-1.00S.

Meiners, Elmo R., to M & W Gear Company. Turbocharger housing construction for marine turbocharger and device for turbocharging a marine engine. 4,068,612, Cl. 115-76.000.

Meissner, David C.: *See—*
Ahrendt, William A ; and Meissner, David C., 4,069,015, Cl. 21-2.50R.

Melnikov-Eikhenvald, Mikhail Alexeevich: *See—*
Dzhaparidze, Levan Nikolaevich; Chakhunashvili, Temuri Alexandrovich; Mainsuradze, Venera Romanovna; Chagunava, Raul Vladimirovich; Kervalishvili, Zurab Yasonovich; Sikharulidze, Nodar Georgievich; Otiashvili, Dali Georgievna; Dubov, Yauzhe Markovich; Bogdanov, Eduard Alimovich; Gogoladze, Georgy Trofimovich; Teisheva, Alla Abelevna; Ryzygraeva, Galina Nikolaevna; Melnikov-Eikhenvald, Mikhail Alexeevich; and Rokva, Temuri Valeryanovich, 4,069,116, Cl. 204-96.000.

Meng, Karl: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,069,334, Cl. 424-273.00P.

Mercer, Robert R., to General Motors Corporation. Latch operating mechanism. 4,068,871, Cl. 292-48.000.

Merck & Co., Inc.: *See—*
Jones, Howard; Yang, Shu Shu; and Jacobus, David P., 4,069,321, Cl. 424-236.000.
Stone, Clement A., 4,069,333, Cl. 424-272.000.
Woodhour, Allen F.; and Hilleman, Maurice R., 4,069,313, Cl. 424-89.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Schacht, Erich; Mehrhof, Werner; Kayser, Detlev; and Simane, Zdenek, 4,069,338, Cl. 424-274.000.

Merkelo, Henry, to University of Illinois Foundation, The. Detachable high-speed optoelectronic sampling head. 4,069,418, Cl. 250-207.000.

Merz, Herbert: *See—*
Langbein, Adolf; Merz, Herbert; Walther, Gerhard; and Stockhaus, Klaus, 4,069,328, Cl. 424-266.000.

Metal Box Limited: *See—*
Forster, William Edward, 4,068,795, Cl. 229-31.00R.

Metal-Cladding, Inc.: *See—*
Humphrey, Frederick H.; and Jarvis, James J., 4,068,777, Cl. 220-1.00B.

Metzger, Grant W., to Carbonoyl Company. Water-free liquid fuel slurry. 4,069,022, Cl. 44-51.000.

Meyer, Glen E., to Goodyear Tire & Rubber Company, The. Carboxyl terminated polydienes. 4,069,384, Cl. 560-91.000.

Meyer, Walter; and Bara, Anton, to Trisa Burstenfabrik AG Triengen. Fountain toothbrush having bristle carrier easily producible by injection molding. 4,068,974, Cl. 401-150.000.

Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, to United Technologies Corporation. Photo-electrolytic production of hydrogen. 4,069,120, Cl. 204-129.000.

Meyers, Frank; Folson, Henry J.; and Meyers, Gwenn B., to Meyers,

Frank. Containment barrier section arrangement. 4,068,478, Cl. 61-1.00F.
Meyers, Gwenn B.: *See—*
Meyers, Frank; Folson, Henry J.; and Meyers, Gwenn B., 4,068,478, Cl. 61-1.00F.
Meyers, Marion Douglas; and Landi, Henry Patrick, to American Cyanamid Company. Process for preparation of an electrode structure containing WO_3 use of the structure in an electrochromic cell. 4,068,928, Cl. 350-160.00R.
Meyers, William G.; and Dirks, Arthur A. Trailer anti-jackknifing apparatus. 4,068,860, Cl. 280-432.000.
Mezzera S.p.A.: *See—*
Pinter, Enzo, 4,069,014, Cl. 8-111.000.
MFB-Neuwerk Mechanische Fensterbehange GmbH: *See—*
Benthin, Johannes, 4,068,325, Cl. 4-7.000.
Micai, William; and Kramer, Daniel, to Kramer Trenton Company. Suction accumulator for refrigeration systems. 4,068,493, Cl. 62-194.000.
Michael Business Machines Corporation: *See—*
Dimopoulos, George H., 4,068,836, Cl. 270-58.000.
Michaud, Horst; Ortenburger, Gunter; Poschinger, Wilhelm; Rock, Heinrich; and Seeholzer, Josef, to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft. Method of preparing melamine from cyanamide and/or dicyandiamide. 4,069,383, Cl. 544-202.000.
Michels, Wolfgang: *See—*
Ufermann, Werner; Axer, Heinrich; and Michels, Wolfgang, 4,068,991, Cl. 425-81.000.
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Farcy, Jean-Claude; Girard, Genevieve; and Michon, Maurice, 4,069,458, Cl. 330-4.300.
Mickus, Robert R.; and Munson, James T., to Rice Growers Association of California. Coated seed and method of seeding. 4,068,602, Cl. 111-1.000.
Midcon Pipeline Equipment Co.: *See—*
Cottam, Spencer D., 4,069,088, Cl. 156-392.000.
Midrex Corporation: *See—*
Ahrendt, William A.; and Meissner, David C., 4,069,015, Cl. 21-2.50R.
Mikami, Ryuzo; and Hanada, Tsuneo, to Dow Corning Corporation. Process for preparation of water-soluble, silicone modified alkyd resins. 4,069,178, Cl. 260-22.00S.
Miki, Tsuyoshi: *See—*
Maruyama, Kenjiro; Miki, Tsuyoshi; Nishi, Yoshiyuki; and Takao, Masato, 4,068,339, Cl. 15-215.000.
Milgo Electronic Corporation: *See—*
Ebner, John Steven; Pizzeri, Francis Charles; and Sprecher, Charles Grimes, III, 4,068,961, Cl. 403-55.000.
Miller, Anthony J., to United States of America, National Aeronautics and Space Administration. Binary to binary coded decimal converter. 4,069,478, Cl. 340-347.0DD.
Miller, Charles Fredrick. Method for completing wire bonds. 4,068,371, Cl. 29-628.000.
Miller, Edward T.: *See—*
Cunningham, Allen B.; and Miller, Edward T., 4,069,470, Cl. 340-15.5TA.
Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., to Ormco Corporation. Orthodontic appliance with porous tooth-abutting face. 4,068,379, Cl. 32-14.00A.
Miller, H. Craig; and Zuhr, Herbert F., to United States of America, Energy. Process for diffusing metallic coatings into ceramics to improve their voltage withstanding capabilities. 4,069,357, Cl. 427-123.000.
Miller, Kenneth D.: *See—*
Lionetti, Thomas A.; Miller, Kenneth D.; and Parker, Levi C., 4,069,141, Cl. 208-309.000.
Miller, Nathaniel W., to Raymond Lee Organization, Inc., The, a part interest. Security latch for sliding doors. 4,068,875, Cl. 292-206.000.
Miller, Russell C., to J. M. Eltzroth & Associates, Inc. Coating compositions and processes. 4,069,187, Cl. 260-29.60M.
Millette, Elmer J.: *See—*
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Milliken Research Corporation: *See—*
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Minamidani, Osamu: *See—*
Tsubakimoto, Tsuneo; Fuzikawa, Iwao; Uchida, Katsumi; and Minamidani, Osamu, 4,069,176, Cl. 260-39.00P.
Minchak, Robert J., to B. F. Goodrich Company, The. Process for substantially gel-free polymerization of norbornene with dicyclopentadiene. 4,069,376, Cl. 526-137.000.
Minnesota Mining and Manufacturing Company: *See—*
Deyak, Frank L.; and Wegwerth, Arthur A., 4,069,368, Cl. 428-447.000.
Koshar, Robert J., 4,069,233, Cl. 260-347.200.
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Minolta Camera Kabushiki Kaisha: *See—*
Kushima, Teizo; Kurita, Takaji; and Mizunoe, Hiroaki, 4,068,936, Cl. 355-1.000.
Matsuda, Motonobu, 4,069,489, Cl. 354-51.000.
Tanaka, Atsuyuki; and Nishioka, Nobuaki, 4,068,934, Cl. 353-26.00A.
Minoprio, William Edward; and Horsfield, Arthur Kenneth, to Dorman Smith Traffic Products Limited. Slidable switch usable with a portable warning lamp. 4,069,404, Cl. 200-60.000.
Mioen, Thomas K.: *See—*
Gorling, Karl Goran; Edenwall, Ingvar A. O.; Jansson, Jan-Olof; and Mioen, Thomas K., 4,069,041, Cl. 75-101.00R.
Misura, Michael S.: *See—*
Leatherman, I. Roger; and Misura, Michael S., 4,069,168, Cl. 252-300.000.
Mitchell, Hal D. Campers tenting with a combination of entry and support means. 4,068,674, Cl. 135-14.00D.
Mitchell, Robert: *See—*
Graham, Thomas G.; Maltese, John; Nesson, Israel; and Mitchell, Robert, 4,069,490, Cl. 354-83.000.
Mitsubishi Chemical Industries Ltd.: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,317, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,318, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,323, Cl. 424-244.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; and Tonomura, Shinji, 4,069,329, Cl. 424-267.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
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Kurozu, Toshio; Yamada, Shinjiro; and Miyashita, Norio, 4,068,890, Cl. 297-355.000.
Mitsui Petrochemical Industries Ltd.: *See—*
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Mitsui Toatsu Chemicals, Incorporated: *See—*
Kanai, Kazumichi; Kimura, Tetsuo; and Fukui, Akito, 4,069,253, Cl. 260-555.00C.
Mitzel, Wilhelm, to G.A.O. Gesellschaft fur Automation und Organisation m.b.H. Apparatus for measuring thickness differences in record carriers, such as bank notes and the like. 4,068,385, Cl. 33-143.00L.
Miyashita, Norio: *See—*
Kurozu, Toshio; Yamada, Shinjiro; and Miyashita, Norio, 4,068,890, Cl. 297-355.000.
Mizuno, Kiyohumi: *See—*
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Mizunoe, Hiroaki: *See—*
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Mizusawa Kagaku Kogyo Kabushiki Kaisha: *See—*
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Mlodozeniec, Arthur Roman; and White, Lawrence Samuel, to Hoffmann-La Roche Inc. Novel dosage form. 4,069,084, Cl. 156-378.000.
Mobil Oil Corporation: *See—*
Herrington, F. John; and Hungerford, Gordon P., 4,069,292, Cl. 264-40.300.
Johnson, George C.; and Schweizer, Albert E., 4,069,144, Cl. 209-11.000.
Mocarski, Stanislaw; and Hall, Daniel W. Method of producing a forged article from prealloyed-premixed water atomized ferrous alloy powder. 4,069,044, Cl. 75-243.000.
Modeen, Marvin O., to IN-Pac Corporation. Small article packaging apparatus. 4,068,448, Cl. 53-131.000.
Molina, Orlando G., to Rockwell International Corporation. Dry developer composition for dye penetrant inspection and method for employing same. 4,069,419, Cl. 250-302.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazole derivatives. 4,069,334, Cl. 424-273.00P.
Monarch Marking Systems: *See—*
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Monsanto Company: *See—*
Barkhuff, Raymond A., Jr.; and Sprenkle, William E., Jr., 4,069,288, Cl. 264-141.000.
Seelye, John F., 4,069,002, Cl. 425-539.000.
Monsod, Godofredo G., Jr. Animal feed composition from water hyacinth plant. 4,069,350, Cl. 426-635.000.
Monte, Salvatore J.; and Sugerman, Gerald, to Kenrich Petrochemicals, Inc. Liquid thermosetting resins containing titanate salts. 4,069,192, Cl. 260-37.0EP.
Montgomery, Marshall A.; and Karplus, Robert, to Rand McNally & Company. Interaction and relativity cart. 4,068,392, Cl. 35-19.00R.
Montjallard, Paul Rene; Laniel, Joseph M.; and Gay-Chatain, Guillaume A. Automatic weapons having a cartridge belt feed. 4,068,557, Cl. 89-33.00E.
Moorby, Donald G.: *See—*
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Moore, Alvin Edward. Wall and wall part. 4,068,429, Cl. 52-204.000.
Moore, Larry D.; Johnson, Isaiah W.; and Thompson, Charley L., Jr., to Concept Marketing, Inc. Ear lobe piercing device. 4,068,668, Cl. 128-330.000.
Moore, William Percy, to Waverly Chemical Co. Method for producing dimensionally stable urea-formaldehyde foams. 4,069,175, Cl. 260-2.50F.
Moorehead, Harvey Robert, to Deseret Pharmaceutical Co., Inc. Catheter placement assembly. 4,068,659, Cl. 128-214.400.

Mores, Lee R.: *See*—
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Mori, Koh: *See*—
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Morooka, Shigeaki; Tamoto, Katsumi; and Matuura, Akira, to Sumitomo Chemical Company, Limited. Preparation of indole derivatives. 4,069,230, Cl. 260-319.100.
Morrell, Edward A.: *See*—
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Morrison, Bertram L., to ACF Industries, Incorporated. Valve seat ring having a corner groove to receive an elastic seal ring. 4,068,821, Cl. 251-172.000.
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Mortoly, John L., to James L. Taylor Manufacturing Company. Clamp with rockable jaw face plate. 4,068,834, Cl. 269-264.000.
Morton, Douglas Ross, Jr., to Upjohn Company, The. 3,7-Inter-m-phenylene-4,5,6-trinor-9-deoxy-9,10-didehydro-PGD_1 compounds. 4,069,389, Cl. 560-53.000.
Morton, Douglas Ross, Jr., to Upjohn Company, The. 3,7-Inter-M-phenylene-4,5,6-trinor-13,14-dihydro-9β-PGD_1 compounds. 4,069,390, Cl. 560-53.000.
Morton, Roger R., to Bausch & Lomb Incorporated. Image analysis system and method for minimizing paralysis angle. 4,069,411, Cl. 235-92.0PC.
Moser, Louis; and Ruegg, Albert, to Rieter Machine Works Ltd. Bobbin tube clamping device. 4,068,806, Cl. 242-46.400.
Moss, Cyril Herbert. Fire safety systems. 4,068,568, Cl. 98-33.00R.
Motorola, Inc.: *See*—
Butler, Walker; and Krahulec, Fred, 4,068,538, Cl. 74-5.220.
Carlow, Earl F.; and Wiles, Michael F., 4,069,510, Cl. 364-200.000.
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich. Method of twist-plying a fibrous product. 4,068,459, Cl. 57-156.000.
Moyer, Ernest P., to American Chain & Cable Company, Inc. Conveyor system control circuit. 4,068,597, Cl. 104-88.000.
Mueller Co.: *See*—
Saha, Narayan C., 4,068,866, Cl. 285-105.000.
Mueller, Karl Friedrich, to Ciba-Geigy Corporation. Fluorinated amphoteric and cationic surfactants. 4,069,244, Cl. 260-501.120.
Muellner, Donald R., to Caterpillar Tractor Co. Bumper and counterweight arrangement and method for assembling the same. 4,068,876, Cl. 293-69.00R.
Mukae, Kazuo: *See*—
Nagasawa, Ikuo; Mukae, Kazuo; Ishii, Takashi; and Tsuda, Koichi, 4,069,061, Cl. 106-73.200.
Mukaida, Yutaka: *See*—
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Mulholland, Kenneth Lee: *See*—
Segraves, William Benjamin; and Mulholland, Kenneth Lee, 4,069,363, Cl. 428-224.000.
Muller, Hans. Process for recovering dextrose and dextrins from protein-containing starch products. 4,069,103, Cl. 195-4.000.
Muller, Jens: *See*—
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Muller, Klaus: *See*—
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Munechika, Kazuyoshi, to Nippon Air Brake Company Ltd. Brake cylinder device including means for automatically compensating for brake pad wear. 4,068,746, Cl. 188-196.00A.
Munnoch, Peter Ian: *See*—
Orloff, George; Munnoch, Peter Ian; and Thomas, Alan, 4,068,560, Cl. 91-36.000.
Munsey, George B. Rotary toaster device. 4,068,569, Cl. 99-327.000.
Munson, James T.: *See*—
Mickus, Robert R.; and Munson, James T., 4,068,602, Cl. 111-1.000.
Murakami, Takuzi: *See*—
Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, 4,068,862, Cl. 280-740.000.
Muramatsu, Fumio: *See*—
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Nakayama, Akira; Ohkoshi, Akio; Muramoto, Shoichi; Natori, Takehisa; Sumi, Koichiro; Nakagawa, Hideaki; and Aozuka, Torao, 4,069,436, Cl. 313-302.000.
Murdock Machine & Engineering Company: *See*—
Herbert, John T.; Kovitch, Frank J.; Sullivan, Paul E.; and Vitt, Stanley P., 4,068,864, Cl. 285-49.000.
Murphy, Charles Vincent, to Du Pont de Nemours, E. I., and Company. Molecular-weight reduction of nitrocellulose by electron beam radiation. 4,069,122, Cl. 204-158.0HE.
Murphy, Patrick Joseph. Work positioning table. 4,068,577, Cl. 100-224.000.
Murray, Robert G.: *See*—
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Muth, Willy: *See*—
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Nagaoka, Tadahiko: *See*—
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Nagaoka, Tadashi, to Matsushita Electric Industrial Co., Ltd. Apparatus for recording and reproducing signals using a disc-like recording medium. 4,069,503, Cl. 358-128.000.
Nagasawa, Ikuo; Mukae, Kazuo; Ishii, Takashi; and Tsuda, Koichi, to Fuji Electric Co., Ltd. Ceramics having nonlinear voltage characteristics. 4,069,061, Cl. 106-73.200.
Nagase, Tsuneyuki: *See*—
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Naito, Hiroyuki: *See*—
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Nakamura, Kenji; and Seno, Iwao, to Japan Suncrux Co., Ltd. Liquid crystal display device for displaying colored patterns. 4,068,926, Cl. 350-160.0LC.
Nakano, Jiro: *See*—
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Nakano, Keita; and Takenouchi, Mutsuo, to Rank Xerox Ltd. Printing using an electrochromic image. 4,068,588, Cl. 101-466.000.
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Nakaya, Akira: *See*—
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Nakayama, Akira; Ohkoshi, Akio; Muramoto, Shoichi; Natori, Takehisa; Sumi, Koichiro; Nakagawa, Hideaki; and Aozuka, Torao, to Sony Corporation. Flat thermionic cathode. 4,069,436, Cl. 313-302.000.
Nalco Chemical Company: *See*—
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Namikoshi, Hajime: *See*—
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Nash, Donald Henry, to Bell Telephone Laboratories, Incorporated. Analog dereverberation system. 4,069,395, Cl. 179-1.00P.
National Distillers and Chemical Corporation: *See*—
Horvitz, David; and Baugh, William D., 4,069,232, Cl. 260-343.600.
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Boettcher, Charles E., 4,069,475, Cl. 365-205.000.
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Nau, Paul R.; Bartlett, James L.; and Gund, Heinz K., to Briggs & Stratton Corporation. Thermostatic device for automatic choke control. 4,068,636, Cl. 123-119.00B.
Navratil, Franz, to Siemens Aktiengesellschaft. Arrangement for producing a constant magnetic field. 4,069,476, Cl. 365-6.000.
Neary, Ralph E., to Schlage Lock Company. Double cylinder safety lock. 4,068,510, Cl. 70-379.00R.
Needham, Riley B., to Phillips Petroleum Company. Producing heavy oil from tar sands. 4,068,717, Cl. 166-272.000.
Nelson, Clifford H. Fireplace heating channel. 4,068,650, Cl. 126-121.000.
Nelson, Lawrence E., to Weyerhaeuser Company. Disposable diaper with improved tape fastener. 4,068,665, Cl. 128-287.000.
Nelson, Peter David; and Banks, Peter Baldwin, to English Electric Valve Company Limited. Methods of operating pyroelectric camera tubes. 4,069,502, Cl. 358-113.000.

Nesson, Israel: *See*—
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Nett, Robert; Fechner, Wolf Dieter; Jettmar, Werner; Polster, Rudolf; Sappok, Reinhard; and Hartmann, Eduard, to BASF Aktiengesellschaft. Phthalocyanine formulations having high gloss, which are stabilized against recrystallization and against change of modification. 4,069,064, Cl. 106-193.00P.
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Newport, Samuel O., to Colt Industries Operating Corporation. Rewind starter pulley assembly. 4,068,644, Cl. 123-185.0BA.
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Nickell, Grason T.; and Alexander, Jack L., Sr., to Air Conditioning Corporation. Energy conservation enthalpy control system and sensor therefor. 4,069,030, Cl. 62-176.00C.
Niemi, Bill Howard, to Stimulation Technology, Inc. Stimulator fault protection circuit. 4,068,669, Cl. 128-419.00R.
Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Watanabe, Yuji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-vibration heat-insulation structure and a process for production thereof. 4,069,284, Cl. 264-43.000.
Ninomiya, Takeshi, to Sony Corporation. Write clock pulse signal generator for digital time base corrector. 4,069,499, Cl. 358-8.000.
Nippon Air Brake Company Ltd.: *See*—
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Nippon Crucible Co., Ltd.: *See*—
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Nippon Electric Company, Ltd.: *See*—
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Nippon Oil Company, Ltd.: *See*—
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Nishita, Sadao; Enomoto, Satoru; Wada, Hisayuki; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Air drying reaction product of a diisocyanate and 1-methyl-2-vinyl-4,6-heptadienol. 4,069,211, Cl. 260-77.5MA.
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Noda, Fumiyoshi: *See*—
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Noland, Wayne B.; and Noland, Gail L. Electrically heated fluid coupling apparatus. 4,069,409, Cl. 219-301.000.
Nolte, Gert; and Dittberner, Wolfgang, to Massey-Ferguson Services N.V. Braking systems. 4,068,899, Cl. 303-6.00A.
Nomura, Takashi: *See*—
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Normand, Alfred, to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques. Method for generating a reducing atmosphere for heat-treating installations. 4,069,071, Cl. 148-16.000.
North American Philips Corporation: *See*—
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Northern Electric Company, Limited: *See*—
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Notelteirs, Victor Rosallie; Rijckaert, Josephus Franciscus; and Ritzen, Johannes Maria Jozef, to U.S. Philips Corporation. Infrared lamp with heat conductive cap assembly and fixture. 4,069,437, Cl. 313-315.000.
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Nute, Ernest B., Jr., to Armstrong Cork Company. Ceiling runner. 4,068,438, Cl. 52-488.000.
Nyc, Wladimir. Variable-ratio transmission. 4,068,539, Cl. 74-230.180.
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Nyunoya, Mizuo, to Aisin Seiki Kabushiki Kaisha. Brake pressure difference warning system for vehicles. 4,068,901, Cl. 303-6.00C.
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Peters, Wilhelmus G. M., 4,068,620, Cl. 118-249.000.
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Willemse, Adrianus H.; and Vola, Mathias J. J. M., 4,068,937, Cl. 355-3.0TR.
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Ohrt, Juergen H., to Vetco Offshore Industries, Inc. Flexible joints for marine risers. 4,068,868, Cl. 285-263.000.
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke. N^2-Alkoxynaphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,069,318, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke. N^2-substituted-L-arginine derivatives and the pharmaceutically acceptable acid addition salts thereof. 4,069,323, Cl. 424-244.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-Naphthalenesulfonyl-L-arginine derivatives, and the pharmaceutically acceptable acid addition salts thereof. 4,069,329, Cl. 424-267.000.
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Hudson, Robert M.; Oles, Edward J., Jr.; and Warning, Clair J., 4,069,070, Cl. 148-12.100.
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Winter, Joseph; and Tyler, Derek E., 4,069,358, Cl. 427-319.000.
Ollinger, James C., to Armstrong Cork Company. Ceiling runner with closure strip. 4,068,444, Cl. 52-731.000.
Olsen, Samuel R.; and Lapp, Robert. Method and apparatus for making business form dummy. 4,068,565, Cl. 93-1.100.
Olson, Stuart William: *See*—
McNair, Hugh Noel; and Olson, Stuart William, 4,068,681, Cl. 137-588.000.
Olsson, Hans: *See*—
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O'Neil, Charles P.; Smorzaniuk, Adam; and Young, James O., to Amerace Corporation. Timing device for fluid valve. 4,068,682, Cl. 137-624.110.
Onizawa, Masao, to Sanyo Trading Co., Ltd. Curable composition. 4,069,213, Cl. 260-78.00A.
Onizawa, Masao, to Sanyo Trading Co., Ltd. Novel curable composition. 4,069,214, Cl. 260-78.00A.
Ono Pharmaceutical Company: *See*—
Hayashi, Masaki; Kori, Seiji; and Shimoji, Katsuichi, 4,069,387, Cl. 560-121.000.
Orem, Henry Philip; Hart, David R.; and Hill, Jerry E., to Jim Walter Resources, Inc. Process for the production of phenolic complexes of hexamethylenetetramine. 4,069,220, Cl. 544-186.000.
Orloff, George; Munnoch, Peter Ian; and Thomas, Alan, to Lucas Industries Limited. Fluid-powered stepping motor. 4,068,560, Cl. 91-36.000.
Ormcó Corporation: *See*—
Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., 4,068,379, Cl. 32-14.00A.
Ortenburger, Gunter: *See*—
Michaud, Horst; Ortenburger, Gunter; Poschinger, Wilhelm; Rock, Heinrich; and Seeholzer, Josef, 4,069,383, Cl. 544-202.000.
Os Screen Co., Ltd.: *See*—
Okumura, Shonosuke, 4,068,921, Cl. 350-117.000.
Osaka Soda Co. Ltd.: *See*—
Nakata, Tetsuya; Shimogawa, Sachio; Hashimoto, Akira; and Yamada, Nobuo, 4,069,174, Cl. 260-2.00A.
Osberg, Daryl F.: *See*—
O'Toole, James F.; and Osberg, Daryl F., 4,068,623, Cl. 118-658.000.
Osborne, Richard Francis, to W. R. Grace & Co. Method and apparatus of bonding superposed sheets of polymeric material in a linear weld. 4,069,080, Cl. 156-272.000.
Oshio, Hideki: *See*—
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Osmalov, Robert: *See*—
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Osterle, Helmut; and Rangger, Herbert, to Hilti Aktiengesellschaft. Power control arrangement for an explosive powder-driven setting gun. 4,068,790, Cl. 227-8.000.
Osterman, Sven-Olof: *See*—
Knutsen, Tryggve Lund; and Osterman, Sven-Olof, 4,068,388, Cl. 34-36.000.
Ostrup, Ivar: *See*—
Ravnkilde, Jorgen Flemming; and Ostrup, Ivar, 4,069,362, Cl. 428-194.000.
Oswald, Fred. Shredding machine. 4,068,805, Cl. 241-159.000.
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O'Toole, James F.; and Osberg, Daryl F., to Addressograph-Multigraph Corporation. Magnetic feed system for developer mix. 4,068,623, Cl. 118-658.000.
Our Mother of Sorrows Church: *See*—
Harper, Paul W., 4,068,449, Cl. 53-319.000.
Oversohl, Wilhelm, to Wasag Chemie AG. Method for the production of combustible ammunition containers and product thereof. 4,068,589, Cl. 102-43.00R.
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Bullock, Michael Kermit; Clay, Sherwood Anderson; and Overton, Gregory Bingham, 4,068,839, Cl. 271-180.000.
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Oxy Metal Industries Corporation: *See*—
Crossley, John Alan; Hacker nee Weimer, Valerie Kathryn; and Clorley, Paul Grahame, 4,069,113, Cl. 204-43.00G.
P. D. George Company, The: *See*—
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Paavola, Oiva A.; and Brugger, Richard D., to Paavola, Oiva A. Blood pressure measuring apparatus and method. 4,068,654, Cl. 128-2.05N.
Pace, John C.: *See*—
Fiorenza, Robert M.; Fleming, Alan J.; Gerlach, Ralph J.; Holmstrom, Larry W.; and Pace, John C., 4,069,488, Cl. 364-474.000.
Pacon Manufacturing Corporation: *See*—
Baumgartner, Frank, 4,069,077, Cl. 156-152.000.
Palani, Narayanaswami. Method and apparatus for producing heat. 4,069,005, Cl. 431-4.000.
Palka, James J., to General Bathroom Products Corporation. Knockdown cabinet having a combination door frame and front wall. 4,069,450, Cl. 312-257.00R.
Palmer, David Nelson, to Combustion Engineering, Inc. Bonding material and method. 4,069,083, Cl. 156-329.000.
Palmer, Guy V., to Raymond Lee Organization, Inc., The, a part interest. Sealable container device. 4,068,775, Cl. 215-331.000.
Palopoli, Frank P.: *See*—
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Pandrol Limited: *See*—
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Pankove, Jacques Isaac; and Carlson, David Emil, to RCA Corporation. Electroluminescent semiconductor device having a body of amorphous silicon. 4,069,492, Cl. 357-17.000.
Panter, Hubert Gerald: *See*—
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Paparatto, Piero: *See*—
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Fulk, James B., 4,068,973, Cl. 270-52.500.
Pappanikolaou, George. Inflatable umbrella. 4,068,675, Cl. 135-20.00B.
Papworth, Charles A. Protective sheath for water-eroded wood piling. 4,068,483, Cl. 61-54.000.
Parisi, Dominick, to Spanjer Brothers Inc. Knockdown sign assembly. 4,068,398, Cl. 40-607.000.
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Parrillo, Henry; Harrington, John Sherman; and Curtis, Glenn Howard, to Marshall and Williams Company. Tenter guide rail gap crossing mechanism. 4,068,356, Cl. 26-91.000.
Parsons, George H., Jr., to Baxter Travenol Laboratories, Inc. Immunoadsorbent polymeric material and method of making same. 4,069,352, Cl. 427-2.000.
Pasch, Lambert, to Uniroyal A.G. Transfer molding method. 4,069,290, Cl. 264-297.000.
Pastorino, Ronald L.: *See*—
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Schmid, August, 4,068,845, Cl. 273-42.00A.
Pattison, Victor A.; and Carr, Russell L. K., to Hooker Chemicals & Plastics Corporation. Immonium salts and derivatives thereof. 4,069,340, Cl. 424-298.000.
Pearson, John, to United States of America, Navy. Means for controlled fragmentation. 4,068,590, Cl. 102-67.000.
Pease Company: *See*—
Shaffer, B. Jeremiah, 4,068,441, Cl. 52-308.000.
Pease, Floyd Tim; Reusswig, Gerhard Helmut; and Edling, Porter Russell, to Offshore Company, The. Method and apparatus for conducting subaqueous operations in ice conditions. 4,068,487, Cl. 61-93.000.
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Marek, Miroslav; Toman, Ludek; and Pecka, Jan, 4,069,125, Cl. 204-159.240.
Peer, Roger L.; and Fisch, Irvin S., to UOP Inc. Countercurrent hydrocarbon conversion with gravity-flowing catalyst particles. 4,069,136, Cl. 208-65.000.
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Pekosh, Raymond J., to Zenith Radio Corporation. Method for dispensing cement onto the seal land of a color CRT funnel. 4,069,354, Cl. 427-64.000.
Pelto, James L.: *See*—
Speers, Samuel F.; and Pelto, James L., 4,068,353, Cl. 24-81.0BF.
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Pennwalt Corporation: *See*—
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Buckley, Jere D.; Markle, David A.; Newell, William H.; and Offner, Abe, 4,068,947, Cl. 355-72.000.
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De Steur, Hubert; Pernegger, Wolfgang; and Bussmann, Egon, 4,068,677, Cl. 137-93.000.
Perronnet, Jacques; and Taliani, Laurent, to Roussel UCLAF. Novel thiadiazoles. 4,069,319, Cl. 424-200.000.
Peters, Wilhelmus G. M., to Oce-van der Grinten N.V. Profiled roller. 4,068,620, Cl. 118-249.000.
Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Limited access lock. 4,068,507, Cl. 70-271.000.
Peterson, Lawrence D.: *See*—
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Peterson, O. James, III. Insulation window. 4,068,428, Cl. 52-202.000.
Petropolskaya, Viktoria Mikhailovna: *See*—
Privalov, Vasily Efimovich; Vail, Evgeny Iosifovich; Khanin, Andrei Mefodievich; Gromov, Evgeny Ivanovich; Petropolskaya, Viktoria Mikhailovna; and Agarkova, Lidia Mikhailovna, 4,069,225, Cl. 260-306.80R.
Petrus, George P., to General Electric Company. Method and apparatus for bar temperature determination in a hot strip mill. 4,068,511, Cl. 72-13.000.
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Pfeiffer, Arno: *See*—
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Pfeiffer, Gerald P.: *See*—
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Pfeiffer, James W.: *See*—
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Phelps, Robert A. Hidden lock. 4,068,506, Cl. 70-100.000.
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Phillips Petroleum Company: *See*—
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Gagle, Duane W.; and Draper, Homer L., 4,068,968, Cl. 404-7.000.
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Hessert, James E.; and Bertus, Brent J., 4,068,714, Cl. 166-246.000.
Hessert, James E.; Bertus, Brent J.; and Johnston, Chester C., Jr., 4,068,720, Cl. 166-282.000.
Hunt, Harold R., 4,069,298, Cl. 423-456.000.
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Needham, Riley B., 4,068,717, Cl. 166-272.000.
Rutledge, Robert W.; and Ganaway, Franklin D., 4,069,413, Cl. 364-118.000.
Wu, Yulin, 4,069,234, Cl. 260-348.160.
Phillips, Raymond M. Mattress having an upper internal material-containing chamber. 4,068,335, Cl. 5-371.000.
Pickard, Frank W., to Stanford, Eleanor D. J., a part interest. Bicycle lock. 4,068,504, Cl. 70-18.000.
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Pierce, James K., to Dow Chemical Company, The. Oxybis(4,1-phenylene(2-oxo-2,1-ethanediyl)) thiocyanate and its use as an antimicrobial agent. 4,069,341, Cl. 424-302.000.
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Pike, John E.; and Schneider, William P., to Upjohn Company, The. 15-Alkyl prostaglandins E_1. 4,069,386, Cl. 560-121.000.
Pimentel, Daniel R., to Texas Instruments Incorporated. Valve. 4,068,820, Cl. 251-11.000.
Pine, Lloyd A.: *See*—
Riley, Kenneth L.; and Pine, Lloyd A., 4,069,139, Cl. 208-216.000.
Pinter, Enzo, to Mezzera S.p.A. Process and apparatus for bleaching temperature-sensitive fibers. 4,069,014, Cl. 8-111.000.
Pioneer Electronic Corporation: *See*—
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Pitney-Bowes, Inc.: *See*—
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Pitt, William V. Atmospheric resistant doors and method of manufacture. 4,068,431, Cl. 52-204.000.
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Wagner, Armand; Pixius, Robert; and Schon, Francois, 4,069,315, Cl. 423-105.000.
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Platt, Clark I., to Whirlpool Corporation. Combined oscillating and unidirectional agitator for automatic washer. 4,068,503, Cl. 68-133.000.

Plumbium Manufacturing Corporation: *See—*
Green, Bernard J.; and Chorosevic, Jerome J., 4,068,532, Cl. 73-462.000.

Podkletnov, Evgeny Evgenievich, administrators: *See—*
Podkletnov, Evgeny Nikolaevich, deceased; Malkina, Vera Matveevna; and Podkletnov, Evgeny Evgenievich, administrators, 4,068,621, Cl. 118-620.000.

Podkletnov, Evgeny Nikolaevich, deceased; by Malkina, Vera Matveevna; and by Podkletnov, Evgeny Evgenievich, administrators. Installation for continuous enamelling of pipes. 4,068,621, Cl. 118-620.000.

Podolan, Edward G.; Przybysz, Francis C.; and Jozefczak, Thadius F., to General Motors Corporation. Sliding vehicle door. 4,068,407, Cl. 49-215.000.

Poe, Lloyd Richard, to Hartwell Corporation. Gas leak detector. 4,068,522, Cl. 73-40.50R.

Pogers, Richard J. Preparation of aqueous solutions of polyacrylamides. 4,069,161, Cl. 252-8.55D.

Poitras, Andre; and Tailleux, Christian, to Equipment Precibec Inc. Automatically controlled numbering machine. 4,068,582, Cl. 101-76.000.

Polito, Alan J.; and Knight, William S., to Beckman Instruments, Inc. I^{125} Imidazole steroid derivatives. 4,069,305, Cl. 424-1.000.

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Genakis, Joseph M., 4,068,509, Cl. 70-364.00A.

Pollet, Gilbert: *See—*
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Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Isomerization of naphthenes. 4,069,269, Cl. 260-666.00P.

Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Alkylaromatic isomerization. 4,069,270, Cl. 260-668.00A.

Polster, Rudolf: *See—*
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Poo, Faustino: *See—*
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Poo, Ramon E.; and Poo, Faustino, to Ventura International, Inc. Cylindrical container silk screen printer with coordinated screen height and stroke adjustment indexing mechanism. 4,068,579, Cl. 101-38.00R.

Poponiak, Michael R.: *See—*
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Porta Systems Corporation: *See—*
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Porter, William Hunt: *See—*
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Poschinger, Wilhelm: *See—*
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Post, John F. Metal patching composition and method. 4,069,191, Cl. 260-37.0EP.

Pouli, Dirk: *See—*
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PPG Industries, Inc.: *See—*
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Schimmel, Karl F., 4,069,210, Cl. 260-29.2EP.

Precision Mfg Inc-Fabrication Precision Inv: *See—*
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Premo, Kenneth W.: *See—*
Miller, Frank R.; Andreiko, Craig A.; and Premo, Kenneth W., 4,068,379, Cl. 32-14.00A.

Priaroggia, Paolo Gazzana, to Industrie Pirelli Societa per Azioni. Method and apparatus for laying an oil filled cable at depths below the laying equipment. 4,068,489, Cl. 61-105.000.

Prichard, William W.; and Stacey, Francis Wilfred, to Du Pont de Nemours, E. I., and Company. Substituted diphenyl-3-formazancarbonitrile insecticides. 4,069,320, Cl. 424-226.000.

Prince Corporation: *See—*
Marcus, Konrad H., 4,068,930, Cl. 350-277.000.
VanAppledorn, William, 4,068,350, Cl. 17-1.00G.

Pringle, Ray T.; and Ames, Kenneth R., to Frontier Machinery, Inc. Tower drive mechanism for self-propelled sprinkler system. 4,068,679, Cl. 137-344.000.

Privalov, Vasily Efimovich; Vail, Evgeny Iosifovich; Khanin, Andrei Mefodievich; Gromov, Evgeny Ivanovich; Petropolskaya, Viktoria Mikhailovna; and Agarkova, Lidia Mikhailovna. 3-(1-Hydroxyethyl-)imino-1,2,4-dithiazolidine-5-thione. 4,069,225, Cl. 260-306.80R.

Procedyne Corporation: *See—*
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Procter & Gamble Company, The: *See—*
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Proctor, Sidney Ernest, to Austin Hoy & Company Limited. Mineral cutter chains. 4,068,896, Cl. 299-83.000.

Produits Chimiques Ugine Kuhlmann: *See—*
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Prudhomme, C. R. Dual load trailer. 4,068,772, Cl. 214-505.000.

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Podolan, Edward G.; Przybysz, Francis C.; and Jozefczak, Thadius F., 4,068,407, Cl. 49-215.000.

Public Storage, Inc.: *See—*
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Pulda, William F., to Vanguard Machinery Corporation. Stacking of materials. 4,068,765, Cl. 214-6.00G.

Pullman Incorporated: *See—*
Bodinger, Donald C.; Tombers, Paul A.; and Snyder, Richard C., 4,068,411, Cl. 49-408.000.
Marsh, Ronald W.; and Newbury, Grant M., 4,068,601, Cl. 108-134.000.
Marulic, Walter J.; and Ferris, Ray L., 4,068,410, Cl. 49-370.000.

Quaker Oats Company, The: *See—*
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Quanbeck, Sherman H. Floating beam plow. 4,068,723, Cl. 172-267.000.

Quarve, Vernon K., to Graco Inc. Charge control valve and piston assembly for diaphragm pump. 4,068,982, Cl. 417-387.000.

Quinn, Edwin J.: *See—*
Kauffman, William J.; and Quinn, Edwin J., 4,069,173, Cl. 260-2.5AJ.

Quinn, Jerome B.; and Heimark, Edward L., to Philadelphia Gear Corporation. Gear pump assembly. 4,068,740, Cl. 184-6.120.

R. & D. Instruments Limited: *See—*
Williams, Charles Norman; and Roberts, Hugh, 4,069,466, Cl. 338-147.000.

Racine, Francis A.: *See—*
Cadwallader, Robert H.; Darves-Bornoz, Yves; Gasparri, Angelo S.; and Racine, Francis A., 4,068,994, Cl. 425-110.000.

Racine Railroad Products, Inc.: *See—*
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Rader Companies, Inc.: *See—*
Ball, D. Graham, 4,068,488, Cl. 61-105.000.

Rainville, Lucien G. Multi-layered garment for the lower body. 4,068,315, Cl. 2-114.000.

Rakow, Wallace J.; Millette, Elmer J.; and Johnston, Peter J., to Spiller Spring Company. Woven spring unit. 4,068,330, Cl. 5-267.000.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Piperidyl esters of higher di-tri-, and polybasic aliphatic carboxylic acids as stabilizers for polymeric materials. 4,069,196, Cl. 260-45.80N.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Metal salts of hindered piperidine carboxylic acids and stabilized compositions. 4,069,199, Cl. 260-45.75C.

Ramig, Alex, to SCM Corporation. Opacified latex paint containing plastic polymer particles. 4,069,186, Cl. 260-29.6RB.

Ramney, Tiberius, to Bio-Pet Research Company. Refillable permanent collar for animals. 4,068,624, Cl. 119-106.000.

Rand McNally & Company: *See—*
Montgomery, Marshall A.; and Karplus, Robert, 4,068,392, Cl. 35-19.00R.

Randall, Nathan A., to Grover, Harry E.; and Ruppin, Richard C. Inflatable body support apparatus. 4,068,334, Cl. 5-365.000.

Randell, Donald Richard; and Pickles, Wilfred, to Ciba-Geigy AG. Chemical process and products. 4,069,189, Cl. 260-30.60R.

Rangger, Herbert: *See—*
Osterle, Helmut; and Rangger, Herbert, 4,068,790, Cl. 227-8.000.

Rank Xerox Ltd.: *See—*
Kito, Hidetoshi, 4,068,950, Cl. 355-75.000.
Nakano, Keita; and Takenouchi, Mutsuo, 4,068,588, Cl. 101-466.000.
Robertson, Robert, 4,068,938, Cl. 355-4.000.

Rao, Raman K.: *See—*
Reinberg, Alan R.; and Rao, Raman K., 4,069,096, Cl. 156-643.000.

Rapp, James E., to Owens-Illinois, Inc. Process for forming two different indices of refraction in a glass ceramic. 4,069,031, Cl. 65-33.000.

Rappaport, Alfred A. Catalytic heater or warmer. 4,068,651, Cl. 126-208.000.

Rathbun, Richard H.; and West, Robert F., to Stanley Works, The. Heavy duty retractable blade utility knife. 4,068,375, Cl. 30-125.000.

Rathel, Lori A. Pantyhose mender. 4,068,322, Cl. 2-239.000.

Rauchfuss, Arthur A. Method of curing and protecting a concrete column. 4,069,283, Cl. 264-32.000.

Raverdy, Yvan: *See—*
Baud, Christian; Raverdy, Yvan; and Hougeot, Henri, 4,069,121, Cl. 204-129.300.

Ravnkilde, Jorgen Flemming; and Ostrup, Ivar, to Rockwool International A/S. Core material for building elements of sandwich type. 4,069,362, Cl. 428-194.000.

Ray, David L.: *See—*
Sheets, Kerney T., 4,068,535, Cl. 74-242.11A.

Raymond Lee Organization, Inc., The: *See—*
Haywood, Jay L., 4,068,316, Cl. 2-126.000.
Miller, Nathaniel W., 4,068,875, Cl. 292-206.000.
Palmer, Guy V., 4,068,775, Cl. 215-331.000.

Raytheon Company: *See—*
Bartram, James F., 4,069,468, Cl. 340-3.00D.
Lelke, Helmut, 4,069,511, Cl. 364-200.000.

RCA Corporation: *See—*
Anderson, Charles Hammond, 4,069,439, Cl. 313-422.000.
Bazin, Lucas John, 4,069,432, Cl. 307-357.000.
Firester, Arthur Herbert; and Walentine, Joseph Paul, 4,069,484, Cl. 346-33.00F.
Geshner, Robert Andrew; and Sciambi, Louis Joseph, 4,068,390, Cl. 34-239.000.
Gubitose, Nicholas Francis; Gawelko, Leonard; and Satriano, Robert Joseph, 4,068,788, Cl. 225-1.000.

Hurst, Robert Norman, 4,069,500, Cl. 358-10.000.
Kucharewski, Nicholas, 4,069,431, Cl. 307-355.000.
Pankove, Jacques Isaac; and Carlson, David Emil, 4,069,492, Cl. 357-17.000.
Shaw, Joseph Michael; and Zaininger, Karl Heinz, 4,069,094, Cl. 156-612.000.

Rearick, Milton R.: *See—*
Buchovecky, Kalman E.; and Rearick, Milton R., 4,069,042, Cl. 75-208.00R.

Recreation Systems Co.: *See—*
Callecod, Robert L., 4,068,842, Cl. 272-113.000.

Rector, Douglas L.: *See—*
Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., 4,069,224, Cl. 260-295.0AM.

Reed, Charles C.: *See—*
Sharp, Russell G.; Reed, Charles C.; and Cooley, Denton A., 4,068,664, Cl. 128-276.000.

Reed, John A.: *See—*
Boettcher, Charles E.; Karp, Joel A.; Reed, John A.; and Varadi, Andrew G., 4,069,474, Cl. 365-205.000.

Reed, Reginald A.: *See—*
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Reed, Ronald. Scaffolding. 4,068,738, Cl. 182-128.000.

Reedy, Dennis Conway, to International Business Machines Corporation. Transistor-transistor-logic circuit. 4,069,428, Cl. 307-215.000.

Reenstra, Arthur L.: *See—*
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 4,068,527, Cl. 73-704.000.

Reese, Roy C.; and Wehrle, Richard C., to O. W. Reese, Inc. Demolition machine for delining a furnace. 4,068,895, Cl. 299-70.000.

Reflectolite Products, Inc.: *See—*
Hauber, Peter Fritz, 4,068,408, Cl. 49-324.000.

Reggiane Officine Meccaniche Italiane S.p.A.: *See—*
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Regie Nationale des Usines Renault: *See—*
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Reich, Shymon; and Friesem, Albert A., to Yeda Research & Development Co., Ltd. Process for recording holographic information. 4,069,049, Cl. 96-27.00H.

Reid, David Eric: *See—*
Adlam, Christopher; and Reid, David Eric, 4,069,314, Cl. 424-92.000.

Reid, Robert E.: *See—*
Kablaoui, Mahmoud S.; Larkin, John M.; and Reid, Robert E., 4,069,226, Cl. 260-307.00F.

Reif, Robert Bruce, to Hoffmann-La Roche Inc. Novel dosage form. 4,069,086, Cl. 156-378.000.

Reilly, Lawrence C.: *See—*
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Reinberg, Alan R.; and Rao, Raman K., to Texas Instruments Incorporated. Silicon etching process. 4,069,096, Cl. 156-643.000.

Reininga, Tomas Lammert Willem, administrator: *See—*
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Reneau, Bobby J. Underwater pipeline coupling apparatus. 4,068,492, Cl. 61-110.000.

Resare, Nils Carl Hakan, to Atlas Copco Aktiebolag. Vibration damper for impact tool. 4,068,742, Cl. 188-1.00B.

Restonic Corporation: *See—*
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Pease, Floyd Tim; Reusswig, Gerhard Helmut; and Edling, Porter Russell, 4,068,487, Cl. 61-93.000.

Rey, Laurent C. Attachment device for bracelets and the like. 4,068,355, Cl. 24-265.00R.

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Rheodyne Incorporated: *See—*
Gundelfinger, Richard, 4,068,528, Cl. 73-422.0GC.

Rhoden, James A.: *See—*
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Rhone-Poulenc Industries: *See—*
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Canard, Pierre; and Levy, Albert, 4,069,188, Cl. 260-29.70T.
Thomas, Maryvonne; and Grosbois, Jean, 4,069,040, Cl. 75-101.0BE.

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Ribka, Joachim: *See—*
Heinrich, Ernst; and Ribka, Joachim, 4,069,012, Cl. 8-41.00C.

Rice, Edward K., to Unicon Parking Structures, Inc. Demountable multiple level building structures. 4,068,420, Cl. 52-79.900.

Rice Growers Association of California: *See—*
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Rice, Kenner C.: *See—*
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Rice, Roy W.: *See—*
McDonough, William J.; and Rice, Roy W., 4,069,059, Cl. 106-57.000.

Richards, Cecil Graham, to B. C. Richards & Co. Pty. Ltd. Ball valve. 4,068,822, Cl. 251-315.000.

Richards, Gerald F.: *See—*
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Richardson-Merrell Inc.: *See—*
Horgan, Stephen W.; Palopoli, Frank P.; and Schwoegler, Edward J., 4,069,222, Cl. 260-293.520.

Richtzenhain, Hermann; and Stephan, Rudolf, to Dynamit Nobel Aktiengesellschaft. Stabilization of 1,1,1-trichloroethane with a four component system. 4,069,265, Cl. 260-652.50R.

Riecker, Johann Georg, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Apparatus for removing dust-containing gases during coking operations. 4,069,108, Cl. 202-263.000.

Riederer, Wolfgang: *See—*
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Riegraf, Gerhard; and Rudolf, Hans, to Gerhard Riegraf KG. Savings bank. 4,068,797, Cl. 232-4.00R.

Rieter Machine Works Ltd.: *See—*
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Notelteirs, Victor Rosallie; Rijckaert, Josephus Franciscus; and Ritzen, Johannes Maria Jozef, 4,069,437, Cl. 313-315.000.

Riley, Kenneth L.; and Pine, Lloyd A., to Exxon Research & Engineering Co. Hydrodesulfurization of oil utilizing a narrow pore size distribution catalyst. 4,069,139, Cl. 208-216.000.

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Ritzerfeld, Gerhard. Copying apparatus. 4,068,948, Cl. 355-75.000.

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Robertson, Robert, to Rank Xerox Ltd. Electrostatic color printing utilizing discrete potentials. 4,068,938, Cl. 355-4.000.

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Rockwell International Corporation: *See—*
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Rockwool International A/S: *See—*
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Rodgers, Frank J.; and Gibson, Harold, to Nycoil Company. Air hose fitting. 4,068,867, Cl. 285-174.000.

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Rohde, Vernon Carl, to Du Pont de Nemours, E. I., and Company. Method and apparatus for stopper removal. 4,068,798, Cl. 233-26.000.

Rohm GmbH: *See—*
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Rohm and Haas Company: *See—*
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Rokholt, Jorgen, to Maskin A/S K. Lund & Co. Method and arrangement for removing a gas cushion. 4,069,115, Cl. 204-67.000.

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Root, Ernest F., to Itek Corporation. Self-jigging method of fabricating solar collector heat trap from flexible plastic roll material. 4,068,361, Cl. 29-157.30R.

Rosenberger, Siegfried; and Schmidt, Andreas, to Ciba-Geigy Corporation. Diones and their use as polymer stabilizers. 4,069,197, Cl. 260-45.8NE.

Ross, Cray L. Method and a tool for cutting materials. 4,068,548, Cl. 83-1.000.

Ross, Thaddeus C., to Cavitron Corporation. Optical gas analyzer. 4,069,420, Cl. 250-341.000.

Rossetti, Attilio. Tapping head. 4,068,977, Cl. 408-177.000.

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Rothman, Ulf Sven Erik, to Pharmacia Aktiebolag. X-ray contrast preparation containing a hydrophilic polymer containing amino groups. 4,069,306, Cl. 424-4.000.

Rothmans of Pall Mall Canada Limited: *See—*
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Rouse, Paul S. Bicycle generator circuit. 4,069,451, Cl. 322-1.000.

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Rowe, Murray A., to CMI Corporation. Concrete finishing machines. 4,068,970, Cl. 404-120.000.

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Ruegg, Albert: *See—*
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Rutledge, Robert W.; and Ganaway, Franklin D., to Phillips Petroleum Company. Process measurement and control. 4,069,413, Cl. 364-118.000.

Ryan, Fred W.; and Webber, Robert J. Internal oil seal for piston. 4,068,563, Cl. 92-157.000.

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Saha, Narayan C., to Mueller Co. Stab-type joint for smooth end or flareless pipe. 4,068,866, Cl. 285-105.000.

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Saito, Kazuhisa; and Ogawa, Hiroyasu, to Toho Beslon Co., Ltd. Process for producing carbon fibers. 4,069,297, Cl. 423-447.600.

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Sakai, Toshimitsu; Kawai, Mitsuo; and Mizuno, Kiyohumi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Hydraulic transmission control device. 4,068,543, Cl. 74-866.000.

Sakaki, Yoshihiro, to Nissan Motor Co., Ltd. Seal assembly in rotary regenerative heat exchanger. 4,068,708, Cl. 165-9.000.

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Sanders Associates, Inc.: *See—*
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Sano, Jun, to Tokyo Shibaura Electric Co., Ltd. Amplifier circuit having two negative feedback circuits. 4,069,461, Cl. 330-260.000.

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Santucci, Nicola; Aleksandrovic, Zabotin Aleksandr; Dmitrievich, Loschilin Evghenii; Lvovich, Galperin Aleksandr; and Archakovich, Onikov Eduard, to Nuovo Pignone S.p.A.; and ZNIKHBI: Tsentralny Nauche - issledevatelsky institut khlopehatobumezhnol promyshlennestl. Supporting members for a revolving comb on a multished weaving loom. 4,068,685, Cl. 139-188.00R.

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Sanyo Trading Co., Ltd.: *See—*
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Sapp, Lawrence G.; Slappey, James F.; and Nixon, C. Bart. Unitizing frame for a pallet. 4,068,599, Cl. 108-55.100.

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Sargisson, Donald F.; and Adamson, Arthur P., to United States of America, National Aeronautics and Space Administration. Gas turbine engine with convertible accessories. 4,068,470, Cl. 60-226.00R.

Sasaki, Iwao: *See—*
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Sasaki, Takehiko: *See—*
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Sato, Fumio; Fujimura, Shigeru; and Urakawa, Toshio, to Sharp Kabushiki Kaisha. Hammer actuated dot matrix pattern printer. 4,068,583, Cl. 101-93.040.

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Inukai, Takashi; Sato, Hideo; and Ishibe, Tetsuya, 4,069,167, Cl. 252-299.000.

Sato, Kimihiko; Sajima, Yasuo; Kuno, Toshihiko; and Ohbe, Harumi, to Asahi Glass Company, Ltd. Electrolytic cell. 4,069,129, Cl. 204-258.000.

Sato, Kuniaki, to Kajima Corporation. H-shaped steel column base member and welding thereof. 4,068,436, Cl. 52-298.000.

Sato, Masaaki: *See—*
Arai, Tashiro; Sato, Masaaki; and Kobayashi, Eiji, 4,068,378, Cl. 30-382.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Cartridge-type ink supply device for labeling machines. 4,068,584, Cl. 101-103.000.

Satriano, Robert Joseph: *See*—
Gubitose, Nicholas Francis; Gawelko, Leonard; and Satriano, Robert Joseph, 4,068,788, Cl. 225-1.000.
Sauer, Don R., to National Semiconductor Corporation. Current comparator circuit. 4,069,460, Cl. 330-257.000.
Saunders, Walter Selden: *See*—
Meinecke, Steven L.; and Saunders, Walter Selden, 4,068,883, Cl. 296-1.00S.
Saviano, A.G.: *See*—
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Sayous, Leon, to Societe Nationale Elf Aquitaine (Production). Device to emit shock waves, with adjustable capacity. 4,069,004, Cl. 431-1.000.
Scanlon, Patricia Marie: *See*—
Gaudette, Roger Robert; Ohlson, John Leonard; and Scanlon, Patricia Marie, 4,069,249, Cl. 260-519.000.
Schacht, Erich; Mehrhof, Werner; Kayser, Detlev; and Simane, Zdenek, to Merck Patent Gesellschaft mit beschrankter Haftung. Indole derivatives and process for their preparation. 4,069,338, Cl. 424-274.000.
Schaefer, Daniel W.; and Klas, Kenneth H., to Allis-Chalmers Corporation. Mower spindle and spindle drive belt braking arrangement for rotary mower having plurality of mower spindles. 4,068,452, Cl. 56-11.600.
Schaumann, Wolfgang: *See*—
Berger, Herbert; Gall, Rudi; Thiel, Max; Schaumann, Wolfgang; and Vomel, Wolfgang, 4,069,330, Cl. 424-267.000.
Scheler, Holger, to Hagenuk Vormals Neufeldt & Kuhnke GmbH. Method of and apparatus for feeding nonround-section bars to screw machines. 4,068,545, Cl. 82-1.00C.
Schellhammer, Carl Wolfgang; and Seng, Florin, to Bayer Aktiengesellschaft. Coumarins containing sulphonylamino groups. 4,069,228, Cl. 260-308.00R.
Schiaffino, Ubaldo. Self-locking screw nut. 4,068,697, Cl. 151-19.00R.
Schillings, Dieter: *See*—
Brand, Werner; Schillings, Dieter; Geers, Leo; and Pietrowski, Edmund, 4,068,542, Cl. 74-625.000.
Schimmel, Karl F., to PPG Industries, Inc. Polymeric products. 4,069,210, Cl. 260-29.2EP.
Schlage Lock Company: *See*—
Neary, Ralph E., 4,068,510, Cl. 70-379.00R.
Schlegel GmbH: *See*—
Eggert, Frank, 4,069,079, Cl. 156-212.000.
Schlossman, Mitchell L.: *See*—
McCarthy, Justin P.; Schlossman, Mitchell L.; and Mores, Lee R., 4,069,347, Cl. 424-358.000.
Schmid, August, to Patentverwertungs-und Finanzierungsgesellschaft, Serania AG. Bowling pin positioning apparatus. 4,068,845, Cl. 273-42.00A.
Schmid, Herbert, Jr.; and Benatti, Edmo. Tool fastening device. 4,068,559, Cl. 90-11.00D.
Schmidt, Andreas: *See*—
Rosenberger, Siegfried; and Schmidt, Andreas, 4,069,197, Cl. 260-45.8NE.
Schmidt, Arnold; and Sybertz, Hans, to Hombak Maschinenfabrik KG. Cutter shaft for wood machining apparatus. 4,068,694, Cl. 144-230.000.
Schmiel, Mark O.: *See*—
Schmiel, William J.; and Schmiel, Mark O., 4,068,351, Cl. 19-105.000.
Schmiel, William J.; and Schmiel, Mark O., to RSM Co. Method of increasing the capacity of a carding machine. 4,068,351, Cl. 19-105.000.
Schmitt, Marvin Glenn, to AMI Industries, Inc. Method and apparatus for stacking and blending bricks or the like. 4,068,766, Cl. 214-6.00A.
Schneider, Ruedi: *See*—
Uhricek, Ivan; and Schneider, Ruedi, 4,068,352, Cl. 24-69.0SK.
Schneider, Warren J., to Green Cross Solid State Oxygen, Inc. Oxygen generator. 4,069,021, Cl. 23-281.000.
Schneider, William P.: *See*—
Pike, John E.; and Schneider, William P., 4,069,386, Cl. 560-121.000.
Schnitzler, Danny Louis, to Union Carbide Corporation. Stuffing box seal. 4,068,853, Cl. 277-102.000.
Scholtus, Christiaan Gustaaf Adolf; Hoeboer, Willebrordus Cornelis; and Ruiter, Antonius, to Ultra-Centrifuge Nederland N.V. Holder for a welding head. 4,068,791, Cl. 228-45.000.
Scholz, Erwin, to Rollei-Werke Franke & Heidecke. Timing mechanism for photographic shutters. 4,069,491, Cl. 354-267.000.
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Schrager, Morton: *See*—
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Schranz, Claude: *See*—
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Schraud, Alfred; and Dressler, Wolfgang, to Artos Dr.-Ing. Meier Windhorst Kommanditgesellschaft. Device for cleaning and heat recovery from the exhaust gases in heat treatment and drying installations. 4,068,709, Cl. 165-95.000.
Schreyer, Kenneth D.; and Behnke, Edward R., to Columbus McKinnon Corporation. Forged master link for sling chain devices. 4,068,467, Cl. 59-93.000.
Schroeder, Guenter: *See*—
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Schubert & Salzer: *See*—
Landwehrkamp, Hans, 4,068,456, Cl. 57-58.890.
Schulte, Klaus: *See*—
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Schwamb Corporation, The: *See*—
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Schwoegler, Edward J.: *See*—
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Sciambi, Louis Joseph: *See*—
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SCM Corporation: *See*—
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Scott, Ernest R.; and MacFarland, Charles H., to Scott & Fetzer Company, The. Transparent belt lifter mounting for vacuum cleaners. 4,068,341, Cl. 15-339.000.
Scott & Fetzer Company, The: *See*—
Scott, Ernest R.; and MacFarland, Charles H., 4,068,341, Cl. 15-339.000.
Scott, Hollis C., to Unadilla Silo Company, Inc. Pre-stressed tension ring structures. 4,068,435, Cl. 52-223.00R.
Scott, Leroy A. Heavy duty lifting devices. 4,068,826, Cl. 254-134.000.
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Sealtran Corporation: *See*—
Drower, Herbert M.; and Rhyner, Edison L., 4,069,081, Cl. 156-272.000.
Seaman, J. Kenneth. Method and apparatus for cutting wood. 4,068,695, Cl. 144-312.000.
Secmer S.A.: *See*—
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Secholzer, Josef: *See*—
Michaud, Horst; Ortenburger, Gunter; Poschinger, Wilhelm; Rock, Heinrich; and Secholzer, Josef, 4,069,383, Cl. 544-202.000.
Seelye, John F., to Monsanto Company. Apparatus improvements in removing articles from wheel blow molding machines. 4,069,002, Cl. 425-539.000.
Segraves, William Benjamin; and Mulholland, Kenneth Lee, to Du Pont de Nemours, E. I., and Company. Crimpable nylon bicomponent filament and fabrics made therefrom. 4,069,363, Cl. 428-224.000.
Seiderman, Maurice. Fenestrated hydrogels for contact lens use and method for making same. 4,068,933, Cl. 351-160.000.
Seidler, Jack Harold, to Akzona Incorporated. Electrical contact socket. 4,068,917, Cl. 339-258.00R.
Self, Richard E., to Control Components, Inc. High energy loss device. 4,068,683, Cl. 137-625.300.
Selhofer, Henri Othmar, to Scriptomatic, Inc. Selective duplicating machine. 4,068,580, Cl. 101-53.000.
Sell, William F.: *See*—
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Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. Oxamic acid derivatives for the prevention of immediate type hypersensitivity reactions. 4,069,343, Cl. 424-319.000.
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Senter, Jonas. Shoe construction with upper of leather or like material anchored to inner sole and sole structure sealed with foxing strip or simulated foxing strip. 4,068,395, Cl. 36-83.000.
Sera, Hidefumi: *See*—
Tsubota, Motohiko; Hanai, Sosuke; Oishi, Yasushi; Sera, Hidefumi; and Yamamoto, Nobuo, 4,069,048, Cl. 96-3.000.
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Shaduya, Vladimir Leontievich: *See—*
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Shaffer, B. Jeremiah, to Pease Company. Cut glass panel. 4,068,441, Cl. 52-308.000.
Shanbrom, Edward, to Edward Shanbrom, Inc. Simplified methods for preparation of very high purity Factor VIII concentrate. 4,069,216, Cl. 260-112.00B.
Shaner, Donald R.: *See—*
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Sharp, Everett H. Telescoping universal joints. 4,068,499, Cl. 64-8.000.
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Shibata, Minoru; Iwasawa, Naozumi; Watanabe, Tadashi; and Yoshihara, Ichiro, to Kansai Paint Company, Limited. Thermosetting acrylic powder coating compositions. 4,069,274, Cl. 260-836.000.
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Simmons, Gerald Paul; and Grooss, Frank August, to Caterpillar Tractor Co. Control linkage for crossing pivotal joint. 4,068,733, Cl. 180-77.00R.
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Koester, Richard H.; and Hickey, Roy E., 4,068,935, Cl. 353-71.000.
Singh, Prithipal, to Syva Company. Lidocaine antigens and antibodies. 4,069,105, Cl. 195-63.000.
Siskin, Michael; and Gillespie, Ronald J., to Exxon Research & Engineering Co. Regeneration of metal halide catalysts via halogenation. 4,069,268, Cl. 260-666.00P.
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SKF Industrial Trading and Development Company, N.V.: *See—*
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Smit, Elzo; and van Wijk, Keimpe, to U.S. Philips Corporation. Stylus unit for pick-ups and/or cutters. 4,068,850, Cl. 274-37.000.
Smith, Charles V. Latched cabinet structure. 4,068,872, Cl. 292-87.000.
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Smith, Richard Seymour; and Hider, Philip Abraham, to Carrier Corporation. Refrigeration system demonstration device. 4,068,391, Cl. 35-13.000.
Smith, Theodore. Water absorbing and urine stable step-wise grafted starch-polyacrylonitrile copolymers. 4,069,177, Cl. 260-17.4GC.
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Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques: *See—*
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Sommer, Edward J., Jr.; and Kenny, Garry R., to Magnetic Separation Systems, Inc. Electromagnetic eddy current materials separator apparatus and method. 4,069,145, Cl. 209-212.000.
Son, Pyong-Nae: *See—*
Layer, Robert Wesley; and Son, Pyong-Nae, 4,069,195, Cl. 260-45.8NW.
Sondermann, Claus: *See—*
Fassett, John R.; Rondas, Ivan V.; George, Joseph P.; and Sondermann, Claus, 4,068,461, Cl. 58-23.00R.
Sony Corporation: *See—*
Doi, Toshitada; and Wakabayashi, Hitoshi, 4,069,394, Cl. 179-1.00G.
Nakayama, Akira; Ohkoshi, Akio; Muramoto, Shoichi; Natori, Takehisa; Sumi, Koichiro; Nakagawa, Hideaki; and Aozuka, Torao, 4,069,436, Cl. 313-302.000.
Ninomiya, Takeshi, 4,069,499, Cl. 358-8.000.
Yamanaka, Seisuke, 4,069,501, Cl. 358-44.000.
Southern Tool Mfg. Co., Inc.: *See—*
Chivers, Thomas R., 4,068,348, Cl. 16-129.000.
Southwire Company: *See—*
Cofer, Daniel B.; and Chia, Enrique Calixto, 4,068,705, Cl. 164-270.000.
Spanjer Brothers Inc.: *See—*
Parisi, Dominick, 4,068,398, Cl. 40-607.000.
Spaulding, Charles A., Jr. Playing surface for handball and racquetball courts. 4,068,840, Cl. 272-3.000.
Specken, Gerald A. Clarification of clay containing water. 4,069,152, Cl. 210-50.000.
Speers, Samuel F.; and Pelto, James L., to Hasbro Development Corporation. Carton clip. 4,068,353, Cl. 24-81.0BF.
Spence-Bate, Harry Arthur Hele. Microfiche records. 4,068,941, Cl. 355-5.000.
Spence-Bate, Harry Arthur Hele. Microform editors. 4,068,945, Cl. 355-54.000.
Spencer, Frederick: *See—*
Fullalove, Richard; and Spencer, Frederick, 4,068,803, Cl. 241-32.000.
Sperner, Franz: *See—*
Harmsen, Nils; and Sperner, Franz, 4,069,370, Cl. 428-671.000.
Sperry Rand Corporation: *See—*
Butler, L. Dennis; Butler, Gene R.; Furtado, Anthony E.; Welker, Jerry W.; and Grey, Donald M., 4,068,804, Cl. 241-101.700.
Jacobson, Peter E.; and Allen, Terry S., 4,068,909, Cl. 339-5.00R.
Webb, Bryant F., 4,068,454, Cl. 56-220.000.
Spiller Spring Company: *See—*
Rakow, Wallace J.; Millette, Elmer J.; and Johnston, Peter J., 4,068,330, Cl. 5-267.000.
Spindler, Walter G., to H & H Licensing Corporation. Multi-stage screw-compressor with different tooth profiles. 4,068,984, Cl. 418-9.000.
Spiral Step Tool Company: *See—*
Breitenstein, Charles Thomas; and Holecek, Allen Roland, 4,068,414, Cl. 51-95.0LH.
Spisak, Edward G. Method of forming rings. 4,068,362, Cl. 29-159.00A.
Spivack, John D., to Ciba-Geigy Corporation. 2,3,5-Trialkyl-4-hydroxybenzylphosphonates and phosphinates. 4,069,200, Cl. 260-45.85S.
Sprecher, Charles Grimes, III: *See—*
Ebner, John Steven; Pizzeri, Francis Charles; and Sprecher, Charles Grimes, III, 4,068,961, Cl. 403-55.000.
Sprenkle, William E., Jr.: *See—*
Barkhuff, Raymond A., Jr.; and Sprenkle, William E., Jr., 4,069,288, Cl. 264-141.000.
Spring, David J.: *See—*
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Staalkat B.V.: *See—*
van der Schoot, Jelle, 4,068,882, Cl. 294-116.000.
Stacey, Francis Wilfred: *See—*
Prichard, William W.; and Stacey, Francis Wilfred, 4,069,320, Cl. 424-226.000.
Stackhouse, Theodore Hahn, to Cincinnati Milacron Inc. Manipulator. 4,068,536, Cl. 74-417.000.
Staffin, H. Kenneth; and Staffin, Robert, to Procedyne Corporation. Gas-diffusion plate for fluidized bed apparatus. 4,068,389, Cl. 34-57.00A.
Staffin, Robert: *See—*
Staffin, H. Kenneth; and Staffin, Robert, 4,068,389, Cl. 34-57.00A.
Stafford, Geoffrey Harry: *See—*
Barker, Sidney Alan; Somers, Peter John; Woodbury, Robin Ross; and Stafford, Geoffrey Harry, 4,069,104, Cl. 195-31.00F.
Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,069,271, Cl. 260-669.00R.
Peevey, Robert M., 4,068,729, Cl. 175-8.000.
Stanford, Eleanor D. J.: *See—*
Pickard, Frank W., 4,068,504, Cl. 70-18.000.
Stanger, Robert J.; and Siebens, Larry N., to Amerace Corporation. Electrical connector apparatus. 4,068,913, Cl. 339-111.000.
Stanley, William L.; Watters, Glenn G.; and Chan, Bock G., to United States of America, Agriculture. Immobilization of enzymes on keratin. 4,069,106, Cl. 195-68.000.
Stanley Works, The: *See—*
Rathbun, Richard H.; and West, Robert F., 4,068,375, Cl. 30-125.000.
Starkovich, John A.; and Blumenthal, Jack L., to TRW. Hydrogen production by catalytic coal gasification. 4,069,304, Cl. 423-648.00R.
Stauffer Chemical Company: *See—*
Blake, Robert J.; and Roy, Guy W., 4,069,170, Cl. 252-441.000.
Hixson, Elmer L.; and Talkington, Carl M., 4,069,118, Cl. 204-99.000.
Teach, Eugene G., 4,069,038, Cl. 71-95.000.
Steam Vacuum Extraction Limited: *See—*
Forward, Raymond John, 4,068,340, Cl. 15-321.000.
Steidlitz, Mark, to EMC Technology, Inc. High heat dissipation mounting for solid state devices and circuits. 4,069,497, Cl. 357-80.000.
Stephan, Rudolf: *See—*
Richtzenhain, Hermann; and Stephan, Rudolf, 4,069,265, Cl. 260-652.50R.
Sterling Drug Inc.: *See—*
Bell, Malcolm R., 4,069,337, Cl. 424-274.000.
Zenitz, Bernard L., 4,069,256, Cl. 260-570.00R.
Stevens, Laurence G., to UOP Inc. Hydrometallurgical recovery of metal values. 4,069,294, Cl. 423-32.000.
Stimulation Technology, Inc.: *See—*
Niemi, Bill Howard, 4,068,669, Cl. 128-419.00R.
Stockhaus, Klaus: *See—*
Langbein, Adolf; Merz, Herbert; Walther, Gerhard; and Stockhaus, Klaus, 4,069,328, Cl. 424-266.000.
Stoker, Robert J. End plate connection unit for beams. 4,068,964, Cl. 403-272.000.
Stoltefuss, Jurgen: *See—*
Lohmer, Karl; von Konig, Anita; Schutz, Siegismund; and Stoltefuss, Jurgen, 4,069,052, Cl. 96-76.00R.
Stoltz, Jean. Section piece for T-section assembly. 4,068,443, Cl. 52-726.000.
Stone, Clement A., to Merck & Co., Inc. Anti-hypertensive compositions. 4,069,333, Cl. 424-272.000.
Stouls, Francois-Xavier Antoine: *See—*
Jolivet, Jean-Claude; and Stouls, Francois-Xavier Antoine, 4,069,504, Cl. 358-142.000.

Straub, Henrik H., to United States of America, Air Force. Adaptive skid detector threshold apparatus. 4,068,903, Cl. 303-99.000.

Straus, P. Barry: *See—*
Lodholz, John C.; and Straus, P. Barry, 4,069,150, Cl. 210-112.000.

Streeter, Walter E. Line level. 4,068,386, Cl. 33-369.000.

Stuart, Clifford C. Golf peg score card. 4,068,972, Cl. 283-49.000.

Stuckmann, Dieter; Jutte, Hans; Babendererde, Siegmund; and Bokemeyer, Reinhard, to Gewerkschaft Eisenhutte Westfalia; and Hochtief AG. Apparatus for driving tunnels or the like. 4,068,485, Cl. 61-85.000.

Stump, L. G., to Sun Oil Company. Wire-line retrievable, mechanically operated spot valve. 4,068,712, Cl. 166-156.000.

Subrick, Joseph, to United States Steel Corporation. Hydraulic flow divider for a mining vehicle. 4,068,728, Cl. 173-27.000.

Suddarth, Jack M. Adjustable lens grinding apparatus. 4,068,413, Cl. 51-55.000.

Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft: *See—*
Michaud, Horst; Ortenburger, Gunter; Poschinger, Wilhelm; Rock, Heinrich; and Seeholzer, Josef, 4,069,383, Cl. 544-202.000.

Suga, Shigeru. Seal structure for tank lid of spray corrosion tester. 4,069,019, Cl. 23-253.00C.

Suga, Shigeru. Lamp equipped with magnets. 4,069,416, Cl. 313-161.000.

Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takai, Kiyoshi; and Maruyama, Noboru, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Treating raw materials containing titanium components. 4,069,295, Cl. 423-49.000.

Suganuma, Yoji: *See—*
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Sugerman, Gerald: *See—*
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Sullivan, Kevin J., to Corning Glass Works. Anticoagulant coating composition. 4,069,185, Cl. 260-29.6HN.

Sullivan, Paul E.: *See—*
Herbert, John T.; Kovitch, Frank J.; Sullivan, Paul E.; and Vitt, Stanley P., 4,068,864, Cl. 285-49.000.

Sumi, Koichiro: *See—*
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Sumitomo Bakelite Company Limited: *See—*
Maruyama, Kenjiro; Miki, Tsuyoshi; Nishi, Yoshiyuki; and Takao, Masato, 4,068,339, Cl. 15-215.000.

Sumitomo Chemical Company, Limited: *See—*
Araki, Masashi; and Nagase, Tsuneyuki, 4,069,385, Cl. 560-106.000.
Morooka, Shigeaki; Tamoto, Katsumi; and Matuura, Akira, 4,069,230, Cl. 260-319.100.

Sumner, John S. Roofing for domical shell structure. 4,068,422, Cl. 52-80.000.

Sun Oil Company: *See—*
Stump, L. G., 4,068,712, Cl. 166-156.000.

Sun Oil Company of Pennsylvania: *See—*
Vanderwerff, William D., 4,069,248, Cl. 260-515.00P.

Sunbeam Equipment Corporation: *See—*
Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., 4,069,007, Cl. 432-3.000.

Super Products Corporation: *See—*
Flynn, Thomas P., 4,068,824, Cl. 254-124.000.

Susman, Samuel Eugene, to American Cyanamid Company. Polychlorinated benzene diamines as curing agents for epoxy resins. 4,069,204, Cl. 260-47.0EN.

Suzuki, Osamu; Tanabe, Keizo; and Hashimoto, Tetsutaro, to Agency of Industrial Science & Technology. Method for manufacture of poly-fatty acids. 4,069,235, Cl. 260-407.000.

Suzuki, Takao: *See—*
Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kinihiko, 4,069,009, Cl. 432-122.000.

Svaty, Vladimir, to Elitex, koncern textilniho strojirenstvi. Technique for controllably reciprocating the weft insertion portion of a shuttle-type weaving loom. 4,068,686, Cl. 139-438.000.

Svoboda, Frantisek: *See—*
Machacek, Frantisek; Bezemek, Vladislav; Kudlacek, Dusan; Kliment, Lubomir; Pirek, Arnost; Smejkal, Vladimir; Svoboda, Frantisek; and Vach, Stanislav, 4,068,320, Cl. 2-227.000.

Swager, William E. Safety lock for a removable shaft. 4,068,960, Cl. 403-20.000.

Swank, Robert K.: *See—*
Lubowski, Stanley J.; and Swank, Robert K., 4,069,355, Cl. 427-70.000.

Sweet, David L.: *See—*
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,068,769, Cl. 214-83.180.

Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., to American Carrier Equipment. Cargo box. 4,068,769, Cl. 214-83.180.

Sybertz, Hans: *See—*
Schmidt, Arnold; and Sybertz, Hans, 4,068,694, Cl. 144-230.000.

Syva Company: *See—*
Singh, Prithipal, 4,069,105, Cl. 195-63.000.

Taboada, John. Pulsed laser densitometer system. 4,068,956, Cl. 356-205.000.

Tadokoro, Eiichi; Aonuma, Masashi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Process for the production of a ferromagnetic metal powder. 4,069,073, Cl. 148-105.000.

Taggart, George W.: *See—*
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Tailleux, Christian: *See—*
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Takahashi, Mitsunao: *See—*
Kamei, Siro; Takeda, Kenzo; Takahashi, Mitsunao; and Nakano, Jiro, 4,069,057, Cl. 106-55.000.

Takai, Kiyoshi: *See—*
Sugahara, Yujiro; Noshi, Yoshibumi; Naito, Hiroyuki; Takai, Kiyoshi; and Maruyama, Noboru, 4,069,295, Cl. 423-49.000.

Takamiya, Bonnosuke, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Multicylinder internal combustion engine. 4,068,637, Cl. 123-119.00A.

Takano, Mitsuo: *See—*
Yano, Nobumitsu; Fukinbara, Itaru; and Takano, Mitsuo, 4,069,351, Cl. 426-650.000.

Takao, Masato: *See—*
Maruyama, Kenjiro; Miki, Tsuyoshi; Nishi, Yoshiyuki; and Takao, Masato, 4,068,339, Cl. 15-215.000.

Takata, Akira; Tanahashi, Toshio; and Oda, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. First and second air feeding means to regulate a/f ratio wherein second air feed requires two signals for actuation. 4,068,472, Cl. 60-276.000.

Takeda Chemical Industries, Ltd.: *See—*
Imada, Akira; Nozaki, Yukimasa; Hasegawa, Toru; and Yoneda, Masahiko, 4,069,316, Cl. 424-122.000.
Tsujimoto, Yasuhiro; Azuma, Junichi; Matsumura, Yoshihiko; and Noda, Katsumi, 4,069,155, Cl. 210-195.00R.

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Komatsu, Tadaaki; Takeda, Hirokazu; Oshio, Hideki; Matsuoka, Kimiaki; and Aramaki, Minoru, 4,069,266, Cl. 260-653.000.

Takeda, Kenzo: *See—*
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Takeda, Takeshi; Muramatsu, Fumio; and Watanabe, Akinori, to Matsushita Electric Industrial Co., Ltd. Recording material. 4,069,440, Cl. 313-465.000.

Takeda, Yosiaki: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,068,633, Cl. 123-117.00A.

Takenouchi, Mutsuo: *See—*
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Taketani, Yutaka: *See—*
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Taki Chemical Co., Ltd.: *See—*
Akazawa, Hakuichi; and Nishimura, Kenichi, 4,069,300, Cl. 423-555.000.

Takita, Hitoshi: *See—*
Nishita, Sadao; Enomoto, Satoru; Wada, Hisayuki; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,069,211, Cl. 260-77.5MA.

Taliani, Laurent: *See—*
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Talkington, Carl M.: *See—*
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Tallent, Othar K., to United States of America, Energy. Method for dissolving plutonium dioxide. 4,069,293, Cl. 423-3.000.

Tamai, Yasuo: *See—*
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Tamao, Yoshikuni: *See—*
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,318, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,323, Cl. 424-244.000.

Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; and Tonomura, Shinji, 4,069,329, Cl. 424-267.000.

Tamoto, Katsumi: *See—*
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Tamura, Masahide: *See—*
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Tanabe, Keizo: *See—*
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Tanahashi, Toshio: *See—*
Takata, Akira; Tanahashi, Toshio; and Oda, Toshio, 4,068,472, Cl. 60-276.000.

Tanaka, Atsuyuki; and Nishioka, Nobuaki, to Minolta Camera Kabushiki Kaisha. Automatic information retrieval device. 4,068,934, Cl. 353-26.00A.

Tanaka, Hidetsugu: *See*—
Kyo, Sunao; Hayashi, Katsuhiko; Tanaka, Hidetsugu; and Oka, Hideaki, 4,069,261, Cl. 260-635.00E.
Tanaka, Minoru; Ishii, Youji; Yagi, Touru; and Otaka, Syoichi, to Honda Giken Kogyo Kabushiki Kaisha. Control system for ignition timing of engine. 4,068,634, Cl. 123-117.00A.
Tanaka, Seizo, to Showa Denko Kabushiki Kaisha; and Sanko Kagaku Kogyo Kabushiki Kaisha. Process and apparatus for forming aerosols of pesticidal chemicals. 4,069,308, Cl. 424-43.000.
Tanaka, Yutaka, to Toytown Corporation. Toy vehicle and trackway. 4,068,402, Cl. 46-216.000.
Tani, Chizuka; and Ogawa, Fumihiro, to Nippon Electric Company, Ltd. Liquid crystal display device. 4,068,925, Cl. 350-160.0LC.
Taniguchi, Susumu, to King Baby Corporation. Shoulder baby bag. 4,068,786, Cl. 224-6.000.
Tanner, Herbert: *See*—
Mannsfeld, Sven Peter; Pfeiffer, Arno; Tanner, Herbert; Wagner, Hans; and Liebetanz, Erich, deceased, 4,069,251, Cl. 260-534.00S.
Tararine, Vsevolod; and Hubert, Jacques. Projectile firing training method and device. 4,068,393, Cl. 35-25.000.
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Taylor, L. Lamoyne: *See*—
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TDK Electronics Company, Limited: *See*—
Umeki, Shinji; Aue, Kazuhide; and Tokuoka, Yasumichi, 4,069,367, Cl. 428-403.000.
Teach, Eugene G., to Stauffer Chemical Company. Acyclic and alicyclic N-substituted halo-2-pyrrolidinones and their utility as herbicides. 4,069,038, Cl. 71-95.000.
Tecnobec, Inc.: *See*—
Belanger, Gerard, 4,068,823, Cl. 254-89.00H.
Teijin Limited: *See*—
Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, 4,069,206, Cl. 260-49.000.
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Teisheva, Alla Abelevna: *See*—
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Tekken Construction Co., Ltd.: *See*—
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Frye, George Joseph, 4,069,447, Cl. 320-1.000.
Veenendaal, Cornelis Teunis, 4,069,453, Cl. 324-158.00F.
Tempel, Gary J. Method and apparatus for a game. 4,068,844, Cl. 273-1.00R.
Tempmaster Corporation: *See*—
Dean, Raymond H.; and Roberts, Michael M., 4,068,736, Cl. 181-224.000.
ter Vrugt, Johannes Wilhelmus: *See*—
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Tesan, Riccardo. Ski propulsion poles. 4,068,610, Cl. 115-24.100.
Testa, Carmen; and Bouton, William J., Jr., to Excelsior Hardware Co. Automatically closing lock. 4,068,873, Cl. 292-101.000.
Teulon, Jean-Marie, to Societe Anonyme dite: Societe Hexachimie. Morpholino containing indane acetic acid esters. 4,069,326, Cl. 424-248.550.
Texaco Development Corporation: *See*—
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Texaco Inc.: *See*—
Allen, Joseph C., 4,068,716, Cl. 166-271.000.
Kablaoui, Mahmoud S.; Larkin, John M.; and Reid, Robert E., 4,069,226, Cl. 260-307.00F.
Lionetti, Thomas A.; Miller, Kenneth D.; and Parker, Levi C., 4,069,141, Cl. 208-309.000.
Wu, Ching H., 4,068,715, Cl. 166-251.000.
Texas Alkyls, Inc.: *See*—
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Texas Instruments Incorporated: *See*—
Baboian, Robert; and Haynes, Gardner S., 4,069,110, Cl. 204-29.000.
Bilek, Frank Thomas, 4,069,508, Cl. 360-99.000.
Doherty, John, Jr., 4,068,800, Cl. 236-101.00C.
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 4,068,527, Cl. 73-704.000.
Kaminski, Perry W., 4,068,369, Cl. 29-622.000.
Pimentel, Daniel R., 4,068,820, Cl. 251-11.000.
Reinberg, Alan R.; and Rao, Raman K., 4,069,096, Cl. 156-643.000.
Texas Medical Products, Inc.: *See*—
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Tezuka, Tohru: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,317, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,318, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,323, Cl. 424-244.000.
Thamm, Horst-Dieter: *See*—
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Tharp, Gordon H.; and Dorland, Herman. Resleeving tool. 4,068,364, Cl. 29-235.000.
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Labana, Santokh S.; and Theodore, Ares N., 4,069,275, Cl. 260-836.000.
Thermon Manufacturing Company: *See*—
Johnson, Ben C.; and Band, Pieter, 4,068,966, Cl. 403-397.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile ballast tamper. 4,068,596, Cl. 104-12.000.
Thiel, Max: *See*—
Berger, Herbert; Gall, Rudi; Thiel, Max; Schaumann, Wolfgang; and Vomel, Wolfgang, 4,069,330, Cl. 424-267.000.
Thomas, Alan: *See*—
Orloff, George; Munnoch, Peter Ian; and Thomas, Alan, 4,068,560, Cl. 91-36.000.
Thomas, Maryvonne; and Grosbois, Jean, to Rhone-Poulenc Industries. Method for recovery of platinum and iridium from catalysts. 4,069,040, Cl. 75-101.0BE.
Thomas, William Anthony: *See*—
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,069,229, Cl. 260-308.00R.
Thompson, Arthur H., to Exxon Research & Engineering Co. Method of making titanium disulfide. 4,069,301, Cl. 423-565.000.
Thompson, Charley L., Jr.: *See*—
Moore, Larry D.; Johnson, Isaiah W.; and Thompson, Charley L., Jr., 4,068,668, Cl. 128-330.000.
Thompson, Lester E., to ElectroPrint, Inc. Electrostatic printer support with controlled electrostatic surface voltage. 4,068,585, Cl. 101-114.000.
Thomson-CSF: *See*—
Baud, Christian; Raverdy, Yvan; and Hougeot, Henri, 4,069,121, Cl. 204-129.300.
Bobenrieth, Albert, 4,069,493, Cl. 357-22.000.
Defranould, Philippe; and Desbois, Jean, 4,069,507, Cl. 358-213.000.
Dubois, Jean Claude; Gazard, Maryse; Duchesne, Claude; and Lavenu, Jean Claude, 4,068,919, Cl. 350-96.0WG.
Thor Dahl, Inc.: *See*—
Gunther, William H., Jr., 4,069,011, Cl. 432-230.000.
Thorn, Donald J.; and Burnham, John W., to Halliburton Company. Method for dissolving polymeric materials in hydrocarbon liquids. 4,068,676, Cl. 137-13.000.
Threshold Technology, Inc.: *See*—
Martin, Thomas B.; Herscher, Marvin B.; and Cox, Robert B., 4,069,393, Cl. 179-1.0SD.
Tilghman Wheelabrator Limited: *See*—
Macmillan, William Robertson, 4,069,025, Cl. 51-434.000.
Timmer, Hendrikus Jacobus Maria, to SKF Industrial Trading and Development Company B.V. Castor fork assembly with protective surface. 4,068,343, Cl. 16-31.00R.
Tippetts, Kenneth Boyd, to Honeywell Information Systems Inc. Transfer mechanism. 4,068,767, Cl. 214-6.0BA.
Tissot, Lucien, to Kernen, Jean-Louis. Coupling device of the back-cover and the middle of a waterproof shaped watch-case. 4,068,466, Cl. 58-90.00R.
Todorovic, Vukasin. Sealing means for radial faces of piston in orbital piston device. 4,068,986, Cl. 418-61.00R.
Toho Beslon Co., Ltd.: *See*—
Saito, Kazuhisa; and Ogawa, Hiroyasu, 4,069,297, Cl. 423-447.600.
Toida, Takashi, to Dai Nippon Insatsu Kabushiki Kaisha. Electro-optical cell. 4,068,923, Cl. 350-160.0LC.
Tokico Ltd.: *See*—
Haraikawa, Tetsuo, 4,068,745, Cl. 188-73.300.
Karasudani, Yasuo; and Haraikawa, Tetsuo, 4,068,743, Cl. 188-71.100.
Tokuoka, Yasumichi: *See*—
Umeki, Shinji; Aue, Kazuhide; and Tokuoka, Yasumichi, 4,069,367, Cl. 428-403.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Hirasawa, Masataka, 4,069,426, Cl. 307-205.000.
Kamata, Shohichi; Kimura, Yoshinori; and Sakuragi, Johji, 4,069,472, Cl. 340-146.30K.
Masuoka, Fujio, 4,069,495, Cl. 357-46.000.
Sano, Jun, 4,069,461, Cl. 330-260.000.
Toland, William G., to Chevron Research Company. Self-retaining roof bolt. 4,068,481, Cl. 61-45.00B.
Toman, Ludek: *See*—
Marek, Miroslav; Toman, Ludek; and Pecka, Jan, 4,069,124, Cl. 204-159.240.

Marek, Miroslav; Toman, Ludek; and Pecka, Jan, 4,069,125, Cl. 204-159.240.

Tombers, Paul A.: *See—*
Bodinger, Donald C.; Tombers, Paul A.; and Snyder, Richard C., 4,068,411, Cl. 49-408.000.

Tong, Shih Yung: *See—*
Goldenberg, Henry Robert; Peck, Richard John; Tong, Shih Yung; and Webb, David Allen, 4,069,392, Cl. 178-58.00R.

Tonomura, Shinji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,317, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,318, Cl. 424-177.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,069,323, Cl. 424-244.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; and Tonomura, Shinji, 4,069,329, Cl. 424-267.000.

Toray Industries, Inc.: *See—*
Kanaoka, Masazumi; Ogawa, Daisuke; Iwayama, Kazuyoshi; and Kihara, Makoto, 4,069,172, Cl. 252-455.00Z.

Torbet, Philip A.; and Eager, Cyril Thomas, to Burke Company, The. Concrete slab hoisting apparatus. 4,068,879, Cl. 294-89.000.

Toth, Bartholomew L., to UMC Industries, Inc. Hot and cold beverage vendor. 4,068,781, Cl. 222-52.000.

Towmotor Corporation: *See—*
Klimo, Robert G., 4,069,445, Cl. 318-139.000.

Townley, Charles O.; Vegell, Allan; and Eaby, Daniel G., to Bio-Dynamics Inc. Platform supported hip prosthesis. 4,068,324, Cl. 3-1.913.

Toyo Engineering Corporation of Japan: *See—*
Kanai, Kazumichi; Kimura, Tetsuo; and Fukui, Akito, 4,069,253, Cl. 260-555.00C.

Toyoda, Akinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for preparation of catalyst component supported on high performance carrier. 4,069,169, Cl. 252-429.00B.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Ito, Teruyuki; and Yamauchi, Tadashi, 4,068,547, Cl. 82-31.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,068,633, Cl. 123-117.00A.
Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Watanabe, Yuji, 4,069,284, Cl. 264-43.000.
Sakai, Toshimitsu; Kawai, Mitsuo; and Mizuno, Kiyohumi, 4,068,543, Cl. 74-866.000.
Sakamoto, Masao; Okuda, Ryoichi; Saito, Hitoshi; and Sasazaki, Kenzi, 4,068,541, Cl. 74-607.000.
Takata, Akira; Tanahashi, Toshio; and Oda, Toshio, 4,068,472, Cl. 60-276.000.

Toytown Corporation: *See—*
Tanaka, Yutaka, 4,068,402, Cl. 46-216.000.

Transportbeton-Beratungs-Gesellschaft mit beschrankter Haftung: *See—*
Friesenborg, Bernd; and Eberhardt, Helmut, 4,069,143, Cl. 209-10.000.

Trasatti, Terrence S.: *See—*
Bennett, David E.; Trasatti, Terrence S.; and Peterson, Lawrence D., 4,068,630, Cl. 123-75.00C.

Trayler, Robert J., to Caterpillar Tractor Co. Bulldozer assembly with locking pin and method. 4,068,721, Cl. 172-1.000.

Trenkler, George: *See—*
Jost, Ernest M.; Reenstra, Arthur L.; and Trenkler, George, 4,068,527, Cl. 73-704.000.

Trisa Burstenfabrik AG Triengen: *See—*
Meyer, Walter; and Bara, Anton, 4,068,974, Cl. 401-150.000.

Troutner, Arthur L., to Trus Joist Corporation. Integral truss-supported deck. 4,068,442, Cl. 52-693.000.

Trufuse International Ltd.: *See—*
Greenberg, Robert, 4,068,618, Cl. 118-60.000.

Trus Joist Corporation: *See—*
Troutner, Arthur L., 4,068,442, Cl. 52-693.000.

Trustman, Allen: *See—*
Iacono, Frederick Della; Trustman, Allen; and LeVine, Donald J., 4,068,916, Cl. 339-177.00R.

TRW: *See—*
Starkovich, John A.; and Blumenthal, Jack L., 4,069,304, Cl. 423-648.00R.

Tsai, Chon-Liang: *See—*
Masubuchi, Koichi; and Tsai, Chon-Liang, 4,069,408, Cl. 219-72.000.

Tsubakimoto, Tsuneo; Fuzikawa, Iwao; Uchida, Katsumi; and Minamidani, Osamu, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Process for producing dyed finely divided hardened benzoguanamine resins having uniform particle size and excelling in dispersibility. 4,069,176, Cl. 260-39.00P.

Tsubota, Motohiko; Hanai, Sosuke; Oishi, Yasushi; Sera, Hidefumi; and Yamamoto, Nobuo, to Fuji Photo Film Co., Ltd. Diffusion transfer photographic materials with color developer scavenger. 4,069,048, Cl. 96-3.000.

Tsuda, Koichi: *See—*
Nagasawa, Ikuo; Mukae, Kazuo; Ishii, Takashi; and Tsuda, Koichi, 4,069,061, Cl. 106-73.200.

Tsujimoto, Yasuhiro; Azuma, Junichi; Matsumura, Yoshihiko; and Noda, Katsumi, to Takeda Chemical Industries, Ltd. Hemodialysis system. 4,069,155, Cl. 210-195.00R.

Tucker, Lyndell L. Fireplace closure. 4,068,699, Cl. 160-33.000.

Tumpey, John Joseph: *See—*
DeBard, James Edward; Borden, Raymond Walter; and Tumpey, John Joseph, 4,068,368, Cl. 29-588.000.

Turbodyne Corporation (Gas Turbine Div.): *See—*
Burkett, Jerry D., 4,069,424, Cl. 307-87.000.

Turner, Roy J.: *See—*
Ball, Kirby L.; Nance, Glenn S.; and Turner, Roy J., 4,068,332, Cl. 5-296.000.

Tyler, Derek E.: *See—*
Winter, Joseph; and Tyler, Derek E., 4,069,358, Cl. 427-319.000.

Uchida, Katsumi: *See—*
Tsubakimoto, Tsuneo; Fuzikawa, Iwao; Uchida, Katsumi; and Minamidani, Osamu, 4,069,176, Cl. 260-39.00P.

Uchida, Yoshiaki; Nakaya, Akira; and Saito, Kunitaka, to Tekken Construction Co., Ltd. Automatic tunnel face hydraulic pressure controlling apparatus in shield type hydraulic tunnel boring system. 4,068,486, Cl. 61-85.000.

Uchida, Yoshiaki: *See—*
Iwamitu, Yasuyuki; Uchida, Yoshiaki; Kobayashi, Shigeru; and Tateno, Masamitu, 4,068,484, Cl. 61-85.000.

Ueno, Hideto, to Hitachi, Ltd. Cassette insertion/ejection apparatus. 4,069,506, Cl. 360-96.000.

Ufermann, Werner; Axer, Heinrich; and Michels, Wolfgang, to G. Siempelkamp & Co. Layer-forming apparatus especially for particle board mats. 4,068,991, Cl. 425-81.000.

Uhricek, Ivan; and Schneider, Ruedi, to Uhricek, Ivan; Schneider, Ruedi; and Vlk, Jaroslav. Adjustable buckle for ski shoes. 4,068,352, Cl. 24-69.0SK.

Ultra-Centrifuge Nederland N.V.: *See—*
Scholtus, Christiaan Gustaaf Adolf; Hoeboer, Willebrordus Cornelis; and Ruiter, Antonius, 4,068,791, Cl. 228-45.000.

UMC Industries, Inc.: *See—*
Toth, Bartholomew L., 4,068,781, Cl. 222-52.000.

Umeki, Shinji; Aue, Kazuhide; and Tokuoka, Yasumichi, to TDK Electronics Company, Limited. Magnetic powder material comprising iron oxide particles with a copper-cobalt alloy coating. 4,069,367, Cl. 428-403.000.

Unadilla Silo Company, Inc.: *See—*
Scott, Hollis C., 4,068,435, Cl. 52-223.00R.

Unicon Parking Structures, Inc.: *See—*
Rice, Edward K., 4,068,420, Cl. 52-79.900.

Union Carbide Corporation: *See—*
Schnitzler, Danny Louis, 4,068,853, Cl. 277-102.000.

Union Oil Company of California: *See—*
Deering, Roland F., 4,069,132, Cl. 208-11.00R.

Uniroyal A.G.: *See—*
Pasch, Lambert, 4,069,290, Cl. 264-297.000.

Uniroyal, Inc.: *See—*
Malz, Russell E., Jr.; and Greenfield, Harold, 4,069,240, Cl. 560-115.000.

United Foam Corporation: *See—*
Morgan, Charles W., 4,069,285, Cl. 264-51.000.

United States of America
Agriculture: *See—*
Kenney, Harold E.; and Donahue, Edward T., 4,069,163, Cl. 252-46.700.
Stanley, William L.; Watters, Glenn G.; and Chan, Bock G., 4,069,106, Cl. 195-68.000.
Air Force: *See—*
Straub, Henrik H., 4,068,903, Cl. 303-99.000.
Army: *See—*
Betts, Robert E., 4,068,591, Cl. 102-70.00R.
Commerce: *See—*
Ballard, David B.; Ogburn, Fielding; and Young, John P., 4,068,381, Cl. 33-1.00R.
Carpenter, Robert J.; and Yee, Kenneth W., 4,069,479, Cl. 340-347.0AD.
Energy: *See—*
Martin, Ronald L.; and Arnold, Richard C., 4,069,457, Cl. 328-235.000.
Miller, H. Craig; and Zuhr, Herbert F., 4,069,357, Cl. 427-123.000.
Tallent, Othar K., 4,069,293, Cl. 423-3.000.
Health, Education and Welfare: *See—*
Weiss, Ulrich; and Rice, Kenner C., 4,069,241, Cl. 560-53.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A. Flame retardant spandex type polyurethanes. 4,069,212, Cl. 260-77.5SP.
Kersten, Leendert; and Johnston, James D. Wrist joint assembly. 4,068,763, Cl. 214-1.0CM.
National Aeronautics and Space Administration: *See—*
Adamson, Arthur P., 4,068,469, Cl. 60-204.000.
Alger, Donald L.; Schwab, William B.; and Furman, Edward R., 4,068,495, Cl. 62-376.000.
Brown, Gerald V., 4,069,028, Cl. 62-3.000.
Miller, Anthony J., 4,069,478, Cl. 340-347.0DD.
Sargisson, Donald F.; and Adamson, Arthur P., 4,068,470, Cl. 60-226.00R.
Navy: *See—*
Kaloi, Cyril M., 4,069,483, Cl. 343-700.0MS.

McDonough, William J.; and Rice, Roy W., 4,069,059, Cl. 106-57.000.
Pearson, John, 4,068,590, Cl. 102-67.000.
Wilner, Irving, 4,068,878, Cl. 294-83.00R.

U.S. Philips Corporation: *See—*
Buysman, Petrus Johannes; Vermeulen, Gerardus Antonius Wilhelmus; and Bos, Cornelis Arie, 4,069,085, Cl. 156-345.000.
Notelteirs, Victor Rosallie; Rijckaert, Josephus Franciscus; and Ritzen, Johannes Maria Jozef, 4,069,437, Cl. 313-315.000.
Smit, Elzo; and van Wijk, Keimpe, 4,068,850, Cl. 274-37.000.
Wanmaker, Willem Lambertus, deceased; Manders, Lambertus Wilhelmus Johannes; and ter Vrugt, Johannes Wilhelmus, 4,069,441, Cl. 313-487.000.

United States Steel Corporation: *See—*
Hudson, John William, 4,069,029, Cl. 62-51.000.
Hudson, Robert M.; Oles, Edward J., Jr.; and Warning, Clair John, 4,069,069, Cl. 148-12.100.
Hudson, Robert M.; Oles, Edward J., Jr.; and Warning, Clair J., 4,069,070, Cl. 148-12.100.
Subrick, Joseph, 4,068,728, Cl. 173-27.000.

United States Surgical Corporation: *See—*
Johanson, Donald L.; and Chan, Thomas S., 4,069,400, Cl. 179-107.00E.

United Technologies Corporation: *See—*
Ficheux, Rene; and Ronsin, Francois, 4,068,741, Cl. 187-29.00R.
Herold, Robert A., 4,068,702, Cl. 164-30.000.
Lemkey, Franklin D.; and Golden, Gerald S., 4,069,171, Cl. 252-454.000.
Meyerand, Russell Gilbert, Jr.; Krascella, Nicholas Leo; and McMahon, David Gue, 4,069,120, Cl. 204-129.000.

Universite Libre de Bruxelles: *See—*
Winand, Rene Fernand Paul, 4,069,114, Cl. 204-64.00R.

University of California, The Regents of the: *See—*
Garrett, Roger E., 4,069,423, Cl. 250-493.000.

University of Illinois Foundation, The: *See—*
Merkelo, Henry, 4,069,418, Cl. 250-207.000.

University of Southern California: *See—*
Bass, Michael; Garmire, Elsa; and McMahon, Thomas R., 4,068,920, Cl. 350-96.0WG.

University Patents, Inc.: *See—*
Marvel, Carl S.; and Wong, Daniel Ting-Man, 4,069,205, Cl. 260-49.000.

Unverferth, Jack W., to Chevron Research Company. Apparatus and process for reducing particulates in a vaporous stream containing condensable hydrocarbons. 4,069,133, Cl. 208-11.00R.

UOP Inc.: *See—*
Giuliani, Chester J., 4,069,135, Cl. 208-65.000.
Greenwood, Arthur R., 4,069,134, Cl. 208-64.000.
Martan, Michael, 4,069,255, Cl. 260-561.00N.
McGuire, John S., 4,068,713, Cl. 166-233.000.
Peer, Roger L.; and Fisch, Irvin S., 4,069,136, Cl. 208-65.000.
Pollitzer, Ernest L.; and Hayes, John C., 4,069,269, Cl. 260-666.00P.
Pollitzer, Ernest L.; and Hayes, John C., 4,069,270, Cl. 260-668.00A.
Stevens, Laurence G., 4,069,294, Cl. 423-32.000.

Upjohn Company, The: *See—*
Callahan, William A.; Glenn, Eldridge Myles; and Rector, Douglas L., 4,069,224, Cl. 260-295.0AM.
Morton, Douglas Ross, Jr., 4,069,389, Cl. 560-53.000.
Morton, Douglas Ross, Jr., 4,069,390, Cl. 560-53.000.
Pike, John E.; and Schneider, William P., 4,069,386, Cl. 560-121.000.
Wright, John B., 4,069,332, Cl. 424-272.000.

Urakawa, Toshio: *See—*
Sato, Fumio; Fujimura, Shigeru; and Urakawa, Toshio, 4,068,583, Cl. 101-93.040.

Urbanietz, Josef: *See—*
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,069,325, Cl. 424-246.000.

Urdaneta, Nelson: *See—*
Conway, Arch W.; and Urdaneta, Nelson, 4,069,452, Cl. 324-103.00P.

Urie, Clarence L.: *See—*
Zehrung, Claude D., Jr.; Urie, Clarence L.; and Martinez, Joseph C., 4,068,455, Cl. 56-344.000.

Vach, Stanislav: *See—*
Machacek, Frantisek; Bezemek, Vladislav; Kudlacek, Dusan; Kliment, Lubomir; Pirek, Arnost; Smejkal, Vladimir; Svoboda, Frantisek; and Vach, Stanislav, 4,068,320, Cl. 2-227.000.

Vail, Evgeny Iosifovich: *See—*
Privalov, Vasily Efimovich; Vail, Evgeny Iosifovich; Khanin, Andrei Mefodievich; Gromov, Evgeny Ivanovich; Petropolskaya, Viktoria Mikhailovna; and Agarkova, Lidia Mikhailovna, 4,069,225, Cl. 260-306.80R.

VanAppledorn, William, to Prince Corporation. Article contour follower mechanism. 4,068,350, Cl. 17-1.00G.

Van der Heijden, Johannes, to S. C. Johnson & Son Inc. Glade overcap for tilt valve. 4,068,782, Cl. 222-402.130.

van der Lely, Cornelis. Prefabricated box-shaped structural section. 4,068,430, Cl. 52-79.700.

van der Lely, Cornelis. Agricultural implements with supporting roller. 4,068,724, Cl. 172-552.000.

van der Schoot, Jelle, to Staalkat B.V. Carrier for articles, such as eggs. 4,068,882, Cl. 294-116.000.

Vanderwerff, William D., to Sun Oil Company of Pennsylvania. Hydrolysis of aromatic nitriles to carboxylic acids. 4,069,248, Cl. 260-515.00P.

Vanguard Machinery Corporation: *See—*
Pulda, William F., 4,068,765, Cl. 214-6.00G.

Van Horne, Clark A.: *See—*
Elder, George E.; Van Horne, Clark A.; and Wu, George C., 4,068,997, Cl. 425-305.100.

van Manen, Dick T., to Voplex Corporation. Cartridge making apparatus. 4,069,091, Cl. 156-498.000.

van Spijker, Willem. Device for dividing an angle. 4,068,380, Cl. 33-1.0AP.

Van Veldhuizen, John. Surface effects air vehicle. 4,068,606, Cl. 114-67.00A.

van Wijk, Keimpe: *See—*
Smit, Elzo; and van Wijk, Keimpe, 4,068,850, Cl. 274-37.000.

Varadi, Andrew G.: *See—*
Boettcher, Charles E.; Karp, Joel A.; Reed, John A.; and Varadi, Andrew G., 4,069,474, Cl. 365-205.000.

Vargiu, Silvio; Paparatto, Piero; Parodi, Antonio; and Brumat, Giorgio, to Societa' Italiana Resine S.I.R. S.p.A. Moulding compositions including unsaturated polyesters and an amide of an unsaturated aliphatic carboxylic acid. 4,069,193, Cl. 260-40.00R.

Varta Batterie Aktiengesellschaft: *See—*
Lauck, Helmut, 4,069,375, Cl. 429-218.000.

Veenendaal, Cornelis Teunis, to Tektronix, Inc. Transistor test fixture. 4,069,453, Cl. 324-158.00F.

Vegell, Allan: *See—*
Townley, Charles O.; Vegell, Allan; and Eaby, Daniel G., 4,068,324, Cl. 3-1.913.

Veiback, Torgny: *See—*
Jerling, Curt; Olsson, Hans; and Veiback, Torgny, 4,068,447, Cl. 52-749.000.

Velo-Bind, Inc.: *See—*
Elder, George E.; Van Horne, Clark A.; and Wu, George C., 4,068,997, Cl. 425-305.100.

Ventura International, Inc.: *See—*
Poo, Ramon E.; and Poo, Faustino, 4,068,579, Cl. 101-38.00R.

Venutti, Luigi, to SGS-ATES Componenti Elettronici S.p.A. Integrated vertical-sweep generator for television receiver. 4,069,443, Cl. 315-395.000.

Verity, Richard Hugh: *See—*
Dacey, Raymond Gwilym; and Verity, Richard Hugh, 4,068,993, Cl. 425-104.000.

Vermeulen, Gerardus Antonius Wilhelmus: *See—*
Buysman, Petrus Johannes; Vermeulen, Gerardus Antonius Wilhelmus; and Bos, Cornelis Arie, 4,069,085, Cl. 156-345.000.

Vetco Offshore, Inc.: *See—*
Shanks, Forrest E., II, 4,068,865, Cl. 285-90.000.

Vetco Offshore Industries, Inc.: *See—*
Ohrt, Juergen H., 4,068,868, Cl. 285-263.000.

Vianova Kunstharz, A.G.: *See—*
Daimer, Wolfgang, 4,069,183, Cl. 260-29.300.

Victor Company of Japan, Limited: *See—*
Yamamura, Takashi, 4,068,851, Cl. 274-39.00A.

Vitaliev, Georgy Viktorovich; Gvinepadze, Alexei Davidovich; Smirnov, Rem Vasilievich; and Sofiisky, Gury Dmitrievich. Associative memory. 4,069,473, Cl. 365-49.000.

Vitt, Stanley P.: *See—*
Herbert, John T.; Kovitch, Frank J.; Sullivan, Paul E.; and Vitt, Stanley P., 4,068,864, Cl. 285-49.000.

Vlk, Jaroslav: *See—*
Uhricek, Ivan; and Schneider, Ruedi, 4,068,352, Cl. 24-69.0SK.

Vogelsinger, Fritz, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Acoustical frictional resistance construction and apparatus for manufacturing an acoustical resistance and an associated magnetic system. 4,069,401, Cl. 179-115.00R.

Vogt, Hans. Apparatus for heating food. 4,068,572, Cl. 99-447.000.

Voinov, Michel, to Battelle Development Corporation. Electric accumulator with a solid electrolyte. 4,069,372, Cl. 429-104.000.

Vola, Mathias J. J. M., to Oce-van der Grinten N.V. Magnetic roller. 4,068,622, Cl. 118-658.000.

Vola, Mathias J. J. M.: *See—*
Willemse, Adrianus H.; and Vola, Mathias J. J. M., 4,068,937, Cl. 355-3.0TR.

Volk, Kenneth Q., Jr., to Public Storage, Inc. Locking device. 4,068,505, Cl. 70-56.000.

Volkman, Josef F., to Hi-Shear Corporation. Inherently torque-limited nut. 4,068,555, Cl. 85-61.000.

Vollnhals, Friedemann; and Wintzer, Klaus, to Siemens Aktiengesellschaft. Power saving circuit for use with a converter circuit in a telephone switching installation. 4,069,396, Cl. 179-2.00A.

Vomel, Wolfgang: *See—*
Berger, Herbert; Gall, Rudi; Thiel, Max; Schaumann, Wolfgang; and Vomel, Wolfgang, 4,069,330, Cl. 424-267.000.

von Falkai, Bela: *See—*
Simm, Walter; Gosling, Claus; Bonart, Richard; and von Falkai, Bela, 4,069,026, Cl. 55-6.000.

von Fraunberg, Karl: *See—*
Hoffmann, Werner; and von Fraunberg, Karl, 4,069,258, Cl. 260-598.000.

von Konig, Anita: *See—*
Lohmer, Karl; von Konig, Anita; Schutz, Siegismund; and Stoltefuss, Jurgen, 4,069,052, Cl. 96-76.00R.

Voplex Corporation: *See—*
van Manen, Dick T., 4,069,091, Cl. 156-498.000.

Vostovich, Joseph Edward, to General Electric Company. Heat resis-

tant ethylene-propylene rubber and insulated conductor product thereof. 4,069,190, Cl. 260-31.80M.

Vysokorodov, Nikolai Sergeevich. Marine propulsive device. 4,068,979, Cl. 416-207.000.

Vyzkumny ustav lesniho hospodarstvi a myslivosti: *See*—
Dressler, Mirko; and Dofek, Ladislav, 4,068,881, Cl. 294-111.000.

Vyzkumny ustav pletarsky: *See*—
Machacek, Frantisek; Bezemek, Vladislav; Kudlacek, Dusan; Kliment, Lubomir; Pirek, Arnost; Smejkal, Vladimir; Svoboda, Frantisek; and Vach, Stanislav, 4,068,320, Cl. 2-227.000.

W. C. Heraeus GmbH: *See*—
Harmsen, Nils; and Sperner, Franz, 4,069,370, Cl. 428-671.000.

W & F Manufacturing Inc.: *See*—
Fleming, Paul D.; and Gullekson, Kenneth N., 4,068,874, Cl. 292-128.000.

W. H. Porter, Inc.: *See*—
Byxbe, Morley Ben; Meckley, Richard Allan; and Porter, William Hunt, 4,068,437, Cl. 52-464.000.

W. R. Grace & Co.: *See*—
Gaudette, Roger Robert; Ohlson, John Leonard; and Scanlon, Patricia Marie, 4,069,249, Cl. 260-519.000.
Osborne, Richard Francis, 4,069,080, Cl. 156-272.000.
Wszolek, Walter R., 4,068,776, Cl. 215-349.000.

Wada, Hisayuki: *See*—
Nishita, Sadao; Enomoto, Satoru; Wada, Hisayuki; Mukaida, Yutaka; Yanaka, Mikiro; and Takita, Hitoshi, 4,069,211, Cl. 260-77.5MA.

Wade, Elman E., to Westinghouse Electric Corporation. Ex-vessel nuclear fuel transfer system. 4,069,098, Cl. 176-31.000.

Wade, Elman E., to Westinghouse Electric Corporation. Nuclear reactor fuel transfer system. 4,069,099, Cl. 176-31.000.

Wagenfeld, Gilbert B., to Cellucap Manufacturing Co. Chef's hat. 4,068,319, Cl. 2-197.000.

Waggonfabrik Uerdingen A.G.: *See*—
Brand, Werner; Schillings, Dieter; Geers, Leo; and Pietrowski, Edmund, 4,068,542, Cl. 74-625.000.

Wagner, Armand; Pixius, Robert; and Schon, Francois, to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED. Recovery of zinc from iron-making or steel-refining furnace dust. 4,069,315, Cl. 423-105.000.

Wagner, Hans: *See*—
Mannsfeld, Sven Peter; Pfeiffer, Arno; Tanner, Herbert; Wagner, Hans; and Liebetanz, Erich, deceased, 4,069,251, Cl. 260-534.00S.

Wakabayashi, Hitoshi: *See*—
Doi, Toshitada; and Wakabayashi, Hitoshi, 4,069,394, Cl. 179-1.00G.

Wakamori, Hideki: *See*—
Kidoh, Kunizoh; Wakamori, Hideki; Asai, Genzo; and Kusida, Kazuo, 4,069,291, Cl. 264-342.00R.

Waldhauer, Charles H., Jr.: *See*—
Brown, Arthur W.; Goetz, Heinz E.; Morrow, Ronald J.; and Waldhauer, Charles H., Jr., 4,068,910, Cl. 339-18.00P.

Walentine, Joseph Paul: *See*—
Firester, Arthur Herbert; and Walentine, Joseph Paul, 4,069,484, Cl. 346-33.00F.

Walser, Kurt: *See*—
Hett, Helmut; and Walser, Kurt, 4,069,013, Cl. 8-79.000.

Walther, Gerhard: *See*—
Langbein, Adolf; Merz, Herbert; Walther, Gerhard; and Stockhaus, Klaus, 4,069,328, Cl. 424-266.000.

Wanmaker, Willem Lambertus, deceased (by Reininga, Tomas Lammert Willem, administrator); Manders, Lambertus Wilhelmus Johannes; and ter Vrugt, Johannes Wilhelmus, to U.S. Philips Corporation. Electric gas discharge lamp having two superposed luminescent layers. 4,069,441, Cl. 313-487.000.

Wannerskog, Carl Axel; and Asberg, Sture Lennart, to SKF Industrial Trading and Development Company, N.V. Device for detecting relative motions in a bearing. 4,069,435, Cl. 310-168.000.

Ward, Charles Spurgeon, to Allied Chemical Corporation. Method of separating an entrained mist from a vapor. 4,069,027, Cl. 55-95.000.

Ward, Clifford, to Ashland Oil, Inc. Method and catalyst for removing mercaptans and mercaptide compounds from aqueous alkaline solutions and hydrocarbon distillates. 4,069,138, Cl. 208-206.000.

Warning, Clair J.: *See*—
Hudson, Robert M.; Oles, Edward J., Jr.; and Warning, Clair J., 4,069,070, Cl. 148-12.100.

Warning, Clair John: *See*—
Hudson, Robert M.; Oles, Edward J., Jr.; and Warning, Clair John, 4,069,069, Cl. 148-12.100.

Warren, Harley K. Anchoring apparatus. 4,068,426, Cl. 52-149.000.

Wasag Chemie AG: *See*—
Oversohl, Wilhelm, 4,068,589, Cl. 102-43.00R.

Wasco Products, Inc.: *See*—
Anghinetti, Joseph R.; and Couture, Paul A., 4,068,417, Cl. 52-1.000.

Washburn, Malcolm E., to Norton Company. Porous silicon oxynitride refractory shapes. 4,069,058, Cl. 106-55.000.

Watanabe, Akinori: *See*—
Takeda, Takeshi; Muramatsu, Fumio; and Watanabe, Akinori, 4,069,440, Cl. 313-465.000.

Watanabe, Hiroo; and Ocho, Yoshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Understructure of an automotive body. 4,068,884, Cl. 296-28.00F.

Watanabe, Masataka: *See*—
Yokota, Hiromu; Namikoshi, Hajime; Watanabe, Masataka; Kato, Kunio; and Ohnishi, Akio, 4,068,670, Cl. 131-2.000.

Watanabe, Tadashi: *See*—
Shibata, Minoru; Iwasawa, Naozumi; Watanabe, Tadashi; and Yoshihara, Ichiro, 4,069,274, Cl. 260-836.000.

Watanabe, Yuji: *See*—
Niimi, Itaru; Kaneko, Yasuhisa; Noda, Fumiyoshi; and Watanabe, Yuji, 4,069,284, Cl. 264-43.000.

Watson, Edwin B.; and Brack, Charles V., to Bendix Corporation, The. Common rail fuel injection system. 4,068,640, Cl. 123-139.0AT.

Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, to Texas Alkyls, Inc. Preparation of unsaturated alcohols. 4,069,260, Cl. 260-632.00B.

Watson, William R., to Nalco Chemical Company. Lubricating system for plow blades. 4,068,725, Cl. 172-801.000.

Watters, Glenn G.: *See*—
Stanley, William L.; Watters, Glenn G.; and Chan, Bock G., 4,069,106, Cl. 195-68.000.

Waverly Chemical Co.: *See*—
Moore, William Percy, 4,069,175, Cl. 260-2.50F.

Weaks, Bill S. Reflector including light filter for photographic use. 4,068,931, Cl. 350-318.000.

Webb, Bryant F., to Sperry Rand Corporation. Crop gathering reel assembly. 4,068,454, Cl. 56-220.000.

Webb, David Allen: *See*—
Goldenberg, Henry Robert; Peck, Richard John; Tong, Shih Yung; and Webb, David Allen, 4,069,392, Cl. 178-58.00R.

Webb, Paul Dale; and Willover, Larry Neil, to Ingersoll-Rand Company. Positive-displacement, fluid machine. 4,068,988, Cl. 418-189.000.

Webber, Robert J.: *See*—
Ryan, Fred W.; and Webber, Robert J., 4,068,563, Cl. 92-157.000.

Weber, Robert A.; and Allmer, Franz, to Graystone Corporation. Track tamper. 4,068,595, Cl. 104-12.000.

Weems, Sterling J.: *See*—
Giesecke, Hans D.; and Weems, Sterling J., 4,068,627, Cl. 122-34.000.

Wegwerth, Arthur A.: *See*—
Deyak, Frank L.; and Wegwerth, Arthur A., 4,069,368, Cl. 428-447.000.

Wehinger, Egbert: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,069,334, Cl. 424-273.00P.

Wehrle, Richard C.: *See*—
Reese, Roy C.; and Wehrle, Richard C., 4,068,895, Cl. 299-70.000.

Weier, Richard M., to G. D. Searle & Co. 7ξ-(Alkoxycarbonyl)-6ξ-alkyl/halo-17-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactones and corresponding 21-carboxylic acids, their salts, and esters. 4,069,219, Cl. 260-239.570.

Weil, Denis C.: *See*—
Booth, Richard A.; Weil, Denis C.; and Yanofsky, Daniel N., 4,068,949, Cl. 355-75.000.

Weirich, Walter, to Gewerkschaft Eisenhutte Westfalia. Apparatus for controlling water spraying operations in mineral mines. 4,068,893, Cl. 299-43.000.

Weiser, Hal, to Durham Industries, Inc. Finger operated magician simulating animated toy. 4,068,403, Cl. 46-241.000.

Weiss, Ulrich; and Rice, Kenner C., to United States of America, Health, Education and Welfare. Steroidal intermediates from the condensation product of dimethyl-3-ketoglutarate and glyoxal. 4,069,241, Cl. 560-53.000.

Welch, Rafael J. Tail gate apparatus having an offset pivot axis. 4,068,892, Cl. 298-17.00R.

Welker, Jerry W.: *See*—
Butler, L. Dennis; Butler, Gene R.; Furtado, Anthony E.; Welker, Jerry W.; and Grey, Donald M., 4,068,804, Cl. 241-101.700.

Welsh, William James: *See*—
Hindle, Peter; and Welsh, William James, 4,069,066, Cl. 134-6.000.

Wenzel, Chester: *See*—
Descoteaux, Claude; and Wenzel, Chester, 4,068,534, Cl. 74-27.000.

Wenzel, Gunter: *See*—
Luke, Johannes; Muth, Willy; Riederer, Wolfgang; and Wenzel, Gunter, 4,069,087, Cl. 156-391.000.

Werkmeister, Johannes, to Hagenuk Vormals Neufeldt & Kuhnke GmbH. Feed apparatus for screw machine. 4,068,546, Cl. 82-1.00C.

West, Robert F.: *See*—
Rathbun, Richard H.; and West, Robert F., 4,068,375, Cl. 30-125.000.

Westerlund, G. Oscar, to Gow Enterprises Limited. Electrolytic system comprising membrane member between electrodes. 4,069,128, Cl. 204-258.000.

Western Electric Company, Inc.: *See*—
Fuchs, Francis Joseph, Jr., 4,068,512, Cl. 72-41.000.
Fuchs, Francis Joseph, Jr., 4,068,517, Cl. 72-253.00R.

Westinghouse Electric Corporation: *See*—
Berringer, Robert T.; and Machado, Octavio J., 4,069,102, Cl. 176-87.000.
Binstock, Morton H., 4,068,475, Cl. 60-646.000.
Cooper, Martin H., 4,069,100, Cl. 176-37.000.
Fischer, Albert G., 4,069,356, Cl. 427-76.000.
Frank, Fred J., 4,069,097, Cl. 176-22.000.
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Heim, Richard C., 4,069,444, Cl. 318-114.000.
Mangus, James D., 4,069,101, Cl. 176-65.000.
McShane, James L., 4,069,433, Cl. 310-325.000.
Wade, Elman E., 4,069,098, Cl. 176-31.000.
Wade, Elman E., 4,069,099, Cl. 176-31.000.

Westvaco Corporation: *See—*
Ball, Frank J., 4,069,063, Cl. 106-97.000.
Weyerhaeuser Company: *See—*
Karna, John D.; Brock, Gregory K.; and Shellhammer, Daniel M., 4,069,018, Cl. 23-232.00E.
Nelson, Lawrence E., 4,068,665, Cl. 128-287.000.
Wheeler, Robert C.: *See—*
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Whetten, Nathan R.: *See—*
Houston, John M.; Young, James R.; and Whetten, Nathan R., 4,069,438, Cl. 313-346.00R.
Whirlpool Corporation: *See—*
Difley, Charles R.; Johnson, Milton J.; and McDonald, William R., 4,068,575, Cl. 100-45.000.
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Whitaker, Roy Francis: *See—*
Healy, James Churchill; and Whitaker, Roy Francis, 4,069,181, Cl. 260-28.5AS.
White, Clarence E., to White Welding and Mfg., Inc. Anti-racking means for doors. 4,068,409, Cl. 49-367.000.
White, Lawrence Samuel: *See—*
Mlodozeniec, Arthur Roman; and White, Lawrence Samuel, 4,069,084, Cl. 156-378.000.
White, Roger Paul, to North American Philips Corporation. Electrophoresis display with buried lead lines. 4,068,927, Cl. 350-160.00R.
White Welding and Mfg., Inc.: *See—*
White, Clarence E., 4,068,409, Cl. 49-367.000.
White, William H.; and Lorie, Mario A., to Harris Corporation. IGFET clock generator. 4,069,429, Cl. 307-265.000.
Whitney, John Kimball; Cosgrove, Allan Hugh; and Flick, Roland Edward, to Gaymar Industries Incorporated. Flexible hose coupling. 4,068,870, Cl. 285-320.000.
Wickwar, Larry D.: *See—*
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Wiederkehr, Rene; and Bickel, Hans, to Ciba-Geigy Corporation. Substituted 7(α-amino phenylacetamido)cephem derivatives. 4,069,324, Cl. 424-246.000.
Wiegert, Philip E., to Mallinckrodt, Inc. Substituted 2,4,6-triiodoisophthalamic acids. 4,069,250, Cl. 260-519.000.
Wiles, Michael F.: *See—*
Carlow, Earl F.; and Wiles, Michael F., 4,069,510, Cl. 364-200.000.
Wilhelm Maier & Sohne UNITAS-Maschinenfabrik: *See—*
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Wilkinson Sword Limited: *See—*
Gascoyne, John M.; Hems, Roger; and Spring, David J., 4,069,345, Cl. 424-343.000.
Willemse, Adrianus H.; and Vola, Mathias J. J. M., to Oce-van der Grinten N.V. Copier image transfer system. 4,068,937, Cl. 355-3.0TR.
Willi, Gary A.: *See—*
Doerfler, Roger E.; and Willi, Gary A., 4,068,900, Cl. 303-6.00C.
Williams, Barry: *See—*
Eaton, David Crawford; Nicholson, Benjamin Eric; and Williams, Barry, 4,069,380, Cl. 544-212.000.
Williams, Charles Norman; and Roberts, Hugh, to R. & D. Instruments Limited. Variable resistance electrical control units. 4,069,466, Cl. 338-147.000.
Williams, Philip David Lane: *See—*
Easy, Maurice Henry; Cramp, Harry Donald; Hartley, Peter Lambert; and Williams, Philip David Lane, 4,069,481, Cl. 343-6.0TV.
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Wilner, Irving, to United States of America, Navy. Container lift coupling. 4,068,878, Cl. 294-83.00R.
Wilson, William. Void cap. 4,068,778, Cl. 220-66.000.
Wilts, James F.: *See—*
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Winand, Rene Fernand Paul, to Universite Libre de Bruxelles. Method for recovering manganese metal from ferromanganese. 4,069,114, Cl. 204-64.00R.
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Winchell, David A., to Baxter Travenol Laboratories, Inc. Supplemental additive indication cap for containers and the like having auxiliary sleeve. 4,068,696, Cl. 150-8.000.
Winkelmann, Heinz, to International Standard Electric Corporation. Transmitter-receiver employing automatic channel hunting and selection. 4,069,454, Cl. 325-25.000.
Winter, Joseph; and Tyler, Derek E., to Olin Corporation. Method for cladding heavy gage plate. 4,069,358, Cl. 427-319.000.
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Vollnhals, Friedemann; and Wintzer, Klaus, 4,069,396, Cl. 179-2.00A.
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Wolfe, Robert W., to Clark Equipment Company. Shift control system for a multiple input transmission. 4,068,537, Cl. 74-477.000.
Wong, Daniel Ting-Man: *See—*
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Wong, Soon Y., to Continental Oil Company. Copper recovery by leaching and ion exchange. 4,069,119, Cl. 204-106.000.
Wonisch, Rudolf, to Friedrich Kocks, Firma. Method and apparatus for handling bar-shaped material. 4,068,516, Cl. 72-201.000.
Wood, Edward H., to Jim Walter Corporation. Side camming balance spring lock. 4,068,406, Cl. 49-181.000.
Wood, Palmer R.; and Rhoden, James A., to Garrett Corporation, The. Starting method and system for a gas turbine. 4,068,468, Cl. 60-39.140.
Woodbury, Robin Ross: *See—*
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Woodhour, Allen F.; and Hilleman, Maurice R., to Merck & Co., Inc. Water-in-oil adjuvant composition. 4,069,313, Cl. 424-89.000.
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Worthington, Mark N. Multi-purpose solar collector/heat exchanger. 4,068,652, Cl. 126-270.000.
Wright, John B., to Upjohn Company, The. Compounds, compositions and methods of use. 4,069,332, Cl. 424-272.000.
Wszolek, Walter R., to W. R. Grace & Co. Plastisol composition and container closure gasket made therefrom. 4,068,776, Cl. 215-349.000.
Wu, Ching H., to Texaco Inc. Method for recovering viscous petroleum. 4,068,715, Cl. 166-251.000.
Wu, George C.: *See—*
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Wu, Tai-Wing, to Eastman Kodak Company. Assay for bilirubin. 4,069,016, Cl. 23-230.00B.
Wu, Tai-Wing; and Dappen, Glen Marshall, to Eastman Kodak Company. Colorimetric assay for bilirubin. 4,069,017, Cl. 23-230.00B.
Wu, Yulin, to Phillips Petroleum Company. Preparation of vicinal epoxides. 4,069,234, Cl. 260-348.160.
Wunderlich, Donald K., to Atlantic Richfield Company. Removing contaminant from hydrocarbonaceous fluid. 4,069,140, Cl. 208-251.00H.
Wyman, Ransome J., to Arnco. Air release regulator. 4,068,690, Cl. 141-95.000.
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Yamamura, Takashi, to Victor Company of Japan, Limited. Audio/video disc playback apparatus with means for correctly positioning the disc relative to a reference level. 4,068,851, Cl. 274-39.00A.
Yamanaka, Seisuke, to Sony Corporation. Solid-state video camera. 4,069,501, Cl. 358-44.000.
Yamauchi, Tadashi: *See—*
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Yamawaki, Masao; Aoki, Katsuo; Oka, Yoshio; Suzuki, Takao; Ina, Osamu; and Hara, Kinihiko, to Nippondenso Co., Ltd. Apparatus for transferring semiconductor wafers. 4,069,009, Cl. 432-122.000.
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Yeargin, G. Scott: *See*—
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Yeh, Tsu-Hsing: *See*—
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Yellen, Richard C.; and Morrell, Edward A., to Champion Products Inc. Jacket with back pack. 4,068,314, Cl. 2-94.000.
Yokota, Hideo, to Canon Kabushiki Kaisha. High speed focusing telephoto lens. 4,068,929, Cl. 350-215.000.
Yokota, Hiromu; Namikoshi, Hajime; Watanabe, Masataka; Kato, Kunio; and Ohnishi, Akio, to Daicel Ltd.; and Japan Tobacco & Salt Public Corporation, The. Smoking composition. 4,068,670, Cl. 131-2.000.
Yonan, Peter K., to G. D. Searle & Co. 1-(1-Naphthoxy)-3-(4-substituted-piperidino)-2-propanols. 4,069,221, Cl. 260-293.620.
Yoneda, Masahiko: *See*—
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Young, James O.: *See*—
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Young, Miriam F.: *See*—
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Young, William O., Jr.; and Jennings, Mansel A., to Young Engineering, Inc. Method and apparatus for controlling a moving web. 4,068,789, Cl. 226-3.000.
Yunick, Henry. Pressure vent. 4,068,635, Cl. 123-119.00B.
Zahnradfabrik Friedrichshafen AG: *See*—
Lang, Armin; and Fassbender, Rolf, 4,068,678, Cl. 137-100.000.
Zaininger, Karl Heinz: *See*—
Shaw, Joseph Michael; and Zaininger, Karl Heinz, 4,069,094, Cl. 156-612.000.
Zanker, Fritz, to BASF Aktiengesellschaft. Manufacture of aliphatic isocyanates. 4,069,238, Cl. 260-453.00P.
Zdor, Gennady Nikolaevich: *See*—
Chachin, Viktor Nikolaevich; Sharin, Jury Efimovich; Zdor, Gennady Nikolaevich; Shaduya, Vladimir Leontievich; and Zhuravsky, Alexandr Julyanovich, 4,068,514, Cl. 72-56.000.
Zehner, Lee R., to Atlantic Richfield Company. Preparation of oxalate esters from carbon monoxide and an alkoxycycloalkene. 4,069,388, Cl. 560-204.000.
Zehrung, Claude D., Jr.; Urie, Clarence L.; and Martinez, Joseph C., to Bluebird International, Inc. Bag for a lawn comber. 4,068,455, Cl. 56-344.000.
Zemke, Hubert R., Jr., to Hexcel Corporation. Lightweight, flexible ski. 4,068,861, Cl. 280-610.000.
Zenith Radio Corporation: *See*—
Pekosh, Raymond J., 4,069,354, Cl. 427-64.000.
Zenitz, Bernard L., to Sterling Drug Inc. Anti-inflammatory phenyl-lower-alkylamines. 4,069,256, Cl. 260-570.00R.
Zenthoefer, Edwin A. Pulley mounting. 4,068,907, Cl. 308-18.000.
Zetner, Wilfred J.: *See*—
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Zimmer Aktiengesellschaft: *See*—
Gey, Werner; Langhauser, Wolfgang; Heinze, Helmut; Rothe, Hans-Joachim; and Freund, Peter, 4,069,194, Cl. 260-40.00R.
Zimmerman, James Eldon. Carrier bucket and apparatus for removably attaching the same to a loader bucket. 4,068,771, Cl. 214-313.000.
Zink, Stanley C.; and Penrod, William R., to Beloit Corporation. Odor elimination apparatus for extruded plastic. 4,069,092, Cl. 156-500.000.
Zito, Ralph, to GEL, Inc. Energy conversion. 4,069,371, Cl. 429-21.000.
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Zory, Peter Stephen, Jr.: *See*—
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Zuhr, Herbert F.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JANUARY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Becker, Otto Alfred. Composite wall element for thermal and acoustic insulation. Re. 29,517, Cl. 52-173.00R.

Borg-Warner Corporation: *See*—
Kent, Bryan P., Re. 29,520, Cl. 192-45.100.

Franklin, Ernest, to United Kingdom Atomic Energy Authority. Stirling cycle heat engines. Re. 29,518, Cl. 60-520.000.

Genaro, Beverly Ann, administratrix: *See*—
Genaro, Joseph L., deceased, Re. 29,516, Cl. 15-97.00B.

Genaro, Joseph L., deceased (by Genaro, Beverly Ann, administratrix), to Shur Brite Wax-O-Matic, Inc. Automatic surface polishing system. Re. 29,516, Cl. 15-97.00B.

Kent, Bryan P., to Borg-Warner Corporation. Sprag assembly for one-way clutches. Re. 29,520, Cl. 192-45.100.

Lloyd, Kenneth Henry: *See*—
Scott, George William Pearson; and Lloyd, Kenneth Henry, Re. 29,519, Cl. 91-499.000.

Scott, George William Pearson; and Lloyd, Kenneth Henry, to Severn Pumps Limited. Pumps. Re. 29,519, Cl. 91-499.000.

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Holtkamp, Reinhold. African violet plant. 4,189, 1-17-78, Cl. 69.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,188, 1-17-78, Cl. 74.000.

Mastaler, John, to Schefflera, Unlimited Inc. Schefflera. 4,187, 1-17-78, Cl. 88.000.

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 4,190, 1-17-78, Cl. 68.000.

Mikkelsen, James C., to Mikkelsens, Inc. Impatiens plant. 4,191, 1-17-78, Cl. 68.000.

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Ryan, John J. Impatiens plant—Aztec. 4,193, 1-17-78, Cl. 68.000.

Ryan, John J. Impatiens plant—hopi. 4,194, 1-17-78, Cl. 68.000.

Schefflera, Unlimited Inc.: *See*—
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Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,188, Cl. 74.000.

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Ara-Bygg AB: *See*—
Hampf, Jan, 246,975, Cl. D14-68.000.

Armstrong, William J., to General Electric Company. Refrigerator door compartments. 246,978, 1-17-78, Cl. D15-89.000.

Ayers Plastics Company, Inc.: *See*—
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Ball Corporation: *See*—
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Campbell, William B., 246,963, Cl. D11-128.000.
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Bechtel, Daniel L. Telescopic sight mount for rifles. 246,983, 1-17-78, Cl. D22-7.000.

Bechtel, Daniel L. Telescopic sight mount for rifles. 246,984, 1-17-78, Cl. D22-7.000.

Bell & Howell Company: *See*—
Shimano, Moto; Duer, Jack M.; and Wadleigh, Edward R., 246,980, Cl. D16-14.000.

Bell, Robert R.; and Alexander, William H., to Vapor Corporation. Positive displacement pump. 246,976, 1-17-78, Cl. D15-7.000.

Bennington, William E. Dental floss dispenser. 246,988, 1-17-78, Cl. D28-64.000.

Bogaerts, Leo C.: *See*—
Morrison, Leonard A.; Bogaerts, Leo C.; Hampton, Robert S., Jr.; and Murphy, John, 246,957, Cl. D10-103.000.

Britt, William James, to Morton-Norwich Products, Inc. Bottle. 246,953, 1-17-78, Cl. D9-143.000.

Buchanan, Patt. Jewelry pin or pendant. 246,961, 1-17-78, Cl. D11-53.000.

Bulldog Toy Company Limited: *See*—
Kyte, Eric, 247,004, Cl. D34-15.0JJ.

Cafolla, Lisa A. Doll or similar article. 247,000, 1-17-78, Cl. D34-4.00R.

Campbell, Sherrill M. Hydraulic reservoir for a track layer vehicle. 246,977, 1-17-78, Cl. D15-28.000.

Campbell, William B., to Ball Corporation. Christmas ornament. 246,962, 1-17-78, Cl. D11-121.000.

Campbell, William B., to Ball Corporation. Christmas ornament. 246,963, 1-17-78, Cl. D11-128.000.

Campbell, William B., to Ball Corporation. Plaque. 246,964, 1-17-78, Cl. D11-139.000.

Costello, Hal F. Electric vaporizer. 246,986, 1-17-78, Cl. D23-148.000.

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Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, to Gillette Company, The. Hair styler attachment. 247,005, 1-17-78, Cl. D28-18.000.

Cunningham, Martin V. Hammer head. 246,948, 1-17-78, Cl. D8-79.000.

Davis, Donald A. Handle for drawers, doors, or the like. 246,949, 1-17-78, Cl. D8-300.000.

Davis, Paul, to Sweetheart Plastics, Inc. Disposable plastic lid. 246,955, 1-17-78, Cl. D9-267.000.

Deuchar, Robert C.; and Waitzman, Gene J. Buffer base housing. 246,973, 1-17-78, Cl. D15-48.000.

Duer, Jack M.: *See*—
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Estes, David V. Investment casting apparatus for jewelers. 246,979, 1-17-78, Cl. D15-135.000.

Fukuoka, Tatsuo. Shoe. 246,943, 1-17-78, Cl. D2-269.000.

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Gillette Company, The: *See*—
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Glover, Robert Lowe. Drill alignment attachment. 246,947, 1-17-78, Cl. D8-71.000.
Green, Robert Franklin, to Johns-Manville Corporation. Building unit to be used for moldings, columns or the like. 246,991, 1-17-78, Cl. D25-74.000.
Green, Robert Franklin, to Johns-Manville Corporation. Building member to be used for moldings, columns or the like. 246,992, 1-17-78, Cl. D25-74.000.
Green, Robert Franklin, to Johns-Manville Corporation. Building unit to be used for moldings, columns, or the like. 246,993, 1-17-78, Cl. D25-74.000.
Guy, Ralph Jesse. Bracelet. 246,959, 1-17-78, Cl. D11-4.000.
Hamilton, Jerry H. Filing container. 246,982, 1-17-78, Cl. D19-92.000.
Hampf, Jan, to Ara-Bygg AB. Staff locator. 246,975, 1-17-78, Cl. D14-68.000.
Hampton, Robert S., Jr.: *See*—
Morrison, Leonard A.; Bogaerts, Leo C.; Hampton, Robert S., Jr.; and Murphy, John, 246,957, Cl. D10-103.000.
Hawkins, Max. Lens measuring instrument. 246,987, 1-17-78, Cl. D24-0.000.
Herman, John. Cigarette holder. 246,995, 1-17-78, Cl. D27-02.000.
Higgins, Hazel L.: *See*—
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Higgins, Jerome D.; and Higgins, Hazel L., to Xomed Inc. Securement device for nasal tube. 246,989, 1-17-78, Cl. D24-53.000.
Hill, Timothy Lee. Combined fluid dispenser and applicator for scalp. 246,998, 1-17-78, Cl. D28-7.000.
Hjelmeland, Selmer. Chess football game board. 246,999, 1-17-78, Cl. D34-5.0FG.
Hughes, George W. Display base for flags and the like. 246,965, 1-17-78, Cl. D11-183.000.
Ichikawa, Kaname, to Modern Royal Co., Ltd. Lighter or the like. 246,996, 1-17-78, Cl. D27-36.000.
Irvin Industries Inc.: *See*—
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Kalt, Henry W. Toaster product. 246,941, 1-17-78, Cl. D1-23.000.
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Katoh, Akira, to Lloyd's Electronics, Inc. Control console for T. V. game. 247,001, 1-17-78, Cl. D34-5.00R.
Katoh, Akira, to Lloyd's Electronics, Inc. Control console for T. V. game. 247,002, 1-17-78, Cl. D34-5.00R.
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L'Europa, Steven D. Container for fashion accessory articles or the like. 246,954, 1-17-78, Cl. D9-238.000.
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Maxwell, David E.; Shaffer, James R.; and Radtke, Lee, to Sun Electric Corporation. Remote starter switch. 246,972, 1-17-78, Cl. D13-32.000.
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McKernon, Terrell A.; and Krieger, Thomas A. Combined bicycle handgrip and brake lever. 246,971, 1-17-78, Cl. D12-179.000.
Mease, John E., to Ayers Plastics Company, Inc. CB Radio mounting unit for automobiles. 246,969, 1-17-78, Cl. D12-155.000.
Modern Royal Co., Ltd.: *See*—
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Palazolo, Salvatore J. Combined sewing machine and tea cart. 246,967, 1-17-78, Cl. D12-33.000.
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Perry, Francis O., to Logical Technical Services Corporation. Digital multimeter or the like. 246,956, 1-17-78, Cl. D10-78.000.
Popiela, Cynthia Louise. T-shirt. 246,942, 1-17-78, Cl. D2-215.000.
Popma, Vincent J.; and Moshofsky, Jerome F. Towel warmer. 246,985, 1-17-78, Cl. D23-77.000.
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301 4,068,440
308 4,068,441
464 4,068,437
488 4,068,438
497 4,068,439
693 4,068,442
726 4,068,443
731 4,068,444
743 4,068,445
747 4,068,446
749 4,068,447

CLASS 53

131 4,068,448
319 4,068,449
331.5 4,068,450
385 4,068,451

CLASS 55

6 4,069,026
95 4,069,027

CLASS 56

11.6 4,068,452
14.4 4,068,453
220 4,068,454
344 4,068,455

CLASS 57

58.89 4,068,456
77.4 4,068,457
108 4,068,458
156 4,068,459
157 TS 4,068,460

CLASS 58

23 AC 4,068,462
4,068,463
23 R 4,068,461
50 R 4,068,464
4,068,465
90 R 4,068,466

CLASS 59

93 4,068,467

CLASS 60

39.14 4,068,468
204 4,068,469
226 R 4,068,470
262 4,068,471
276 4,068,472
282 4,068,473
520 Re.29,518
641 4,068,474
646 4,068,475
671 4,068,476
698 4,068,477

CLASS 61

0.5 4,068,480
1 F 4,068,478
5 4,068,479
45 B 4,068,481
47 4,068,482
54 4,068,483
85 4,068,484
4,068,485
4,068,486
93 4,068,487
105 4,068,488
4,068,489
108 4,068,490
110 4,068,491
4,068,492

CLASS 62

3 4,069,028
51 4,069,029
176 C 4,069,030
194 4,068,493
196 B 4,068,494
376 4,068,495

CLASS 64

8 4,068,499

CLASS 65

33 4,069,031
337 4,069,032

CLASS 66

27 4,068,496
50 B 4,068,497
57 4,068,498
123 4,068,500

CLASS 68

19.1 4,068,501
27 4,068,502
133 4,068,503

CLASS 70

18 4,068,504
56 4,068,505
100 4,068,506
271 4,068,507
364 A 4,068,508
4,068,509
379 R 4,068,510

CLASS 71

25 4,069,033
33 4,069,034
76 4,069,035
88 4,069,036
93 4,069,037
95 4,069,038

CLASS 72

13 4,068,511
41 4,068,512
42 4,068,513
56 4,068,514
115 4,068,515
201 4,068,516
253 R 4,068,517
354 4,068,518
426 4,068,519
427 4,068,520

CLASS 73

19 4,068,521
40.5 R 4,068,522
73 4,068,525
362 AR 4,068,526
422 GC 4,068,528
423 A 4,068,529
425.4 R 4,068,530
4,068,531
462 4,068,532
598 4,068,524
628 4,068,523
704 4,068,527

CLASS 74

5.22 4,068,538
5.6 D 4,068,533
27 4,068,534
230.18 4,068,539
242.11 A 4,068,535
417 4,068,536
476 4,068,540
477 4,068,537
607 4,068,541
625 4,068,542
866 4,068,543

CLASS 75

12 4,069,039
101 BE 4,069,040
101 R 4,069,041
208 R 4,069,042
232 4,069,043
243 4,069,044
251 4,069,045

CLASS 81

3 R 4,068,544

CLASS 82

1 C 4,068,545
4,068,546
31 4,068,547

CLASS 83

1 4,068,548
417 4,068,549
471.2 4,068,550
471.3 4,068,551

CLASS 84

1.06 4,068,552
296 4,068,553

CLASS 85

41 4,068,554
61 4,068,555

CLASS 89

1.814 4,068,556
33 E 4,068,557

CLASS 90

1.6 A 4,068,558
11 D 4,068,559

CLASS 91

36 4,068,560
433 4,068,561
499 Re.29,519

CLASS 92

60.5 4,068,562
157 4,068,563

CLASS 93

1 C 4,068,564
1.1 4,068,565
8 R 4,068,566
93 C 4,068,567

CLASS 96

1 PC 4,069,046
1.4 4,069,047
3 4,069,048
27 H 4,069,049
60 R 4,069,050
66 R 4,069,051
76 R 4,069,052
87 A 4,069,053
115 P 4,069,054
4,069,056
115 R 4,069,055

CLASS 98

33 R 4,068,568

CLASS 99

327 4,068,569
353 4,068,570
408 4,068,571
447 4,068,572
578 4,068,573
587 4,068,574

CLASS 100

45 4,068,575
219 4,068,576
224 4,068,577

CLASS 101

35 4,068,578
38 R 4,068,579
53 4,068,580
4,068,581
76 4,068,582
93.04 4,068,583
103 4,068,584
114 4,068,585
415.1 4,068,586
4,068,587
466 4,068,588

CLASS 102

43 R 4,068,589
67 4,068,590
70 R 4,068,591
70.2 R 4,068,592

CLASS 104

1 R 4,068,593
10 4,068,594
12 4,068,595
4,068,596
88 4,068,597
130 4,068,598

CLASS 106

55 4,069,057
4,069,058
57 4,069,059
65 4,069,060
73.2 4,069,061
93 4,069,062
97 4,069,063
193 P 4,069,064

CLASS 108

55.1 4,068,599
111 4,068,600
134 4,068,601

CLASS 111

1 4,068,602

CLASS 112

121.11 4,068,603
158 E 4,068,604
223 4,068,605

CLASS 114

67 A 4,068,606
102 4,068,607
199 4,068,608
301 4,068,609

CLASS 115

24.1 4,068,610
4,068,611
76 4,068,612

CLASS 116

114 AH 4,068,613

CLASS 118

6 4,068,614
4,068,615
8 4,068,616
50 4,068,617
60 4,068,618
122 4,068,619
249 4,068,620
620 4,068,621
658 4,068,622
4,068,623

CLASS 119

106 4,068,624

CLASS 122

34 4,068,627

CLASS 123

25 A 4,068,625
30 D 4,068,626
59 EC 4,068,628
65 S 4,068,629
75 C 4,068,630
117 A 4,068,632
4,068,633
4,068,634
117 D 4,068,631
119 A 4,068,637
119 B 4,068,635
4,068,636
122 AA 4,068,638
127 4,068,639
139 A 4,068,641
139 AT 4,068,640
140 MP 4,068,642
148 CA 4,068,643
185 BA 4,068,644
193 C 4,068,645
195 C 4,068,646
198 R 4,068,647

CLASS 125

13 R 4,068,648

CLASS 126

120 4,068,649
121 4,068,650
208 4,068,651
270 4,068,652
271 4,068,653

CLASS 127

15 4,069,065

CLASS 128

2.05 N 4,068,654

20 4,068,655
81 A 4,068,656
142 R 4,068,657
208 4,068,658
214 R 4,069,151
214.4 4,068,659
4,068,660
215 4,068,661
232 4,068,662
4,068,663
276 4,068,664
287 4,068,665
290 W 4,068,666
303.15 4,068,667
330 4,068,668
419 R 4,068,669

CLASS 131

2 4,068,670
143 4,068,671
170 A 4,068,672

CLASS 134

6 4,069,066
57 D 4,069,425

CLASS 135

5 R 4,068,673
14 D 4,068,674
20 B 4,068,675

CLASS 137

13 4,068,676
93 4,068,677
100 4,068,678
344 4,068,679
512.1 4,068,680
588 4,068,681
624.11 4,068,682
625.3 4,068,683

CLASS 138

30 4,068,684

CLASS 139

188 R 4,068,685
438 4,068,686

CLASS 141

59 4,068,687
93 4,068,689
95 4,068,690
284 4,068,691
392 4,068,692

CLASS 144

90 A 4,068,688
178 4,068,693
230 4,068,694
312 4,068,695

CLASS 148

1.5 4,069,067
4,069,068
12.1 4,069,069
4,069,070
16 4,069,071
32 4,069,072
105 4,069,073
188 4,069,074

CLASS 150

8 4,068,696

CLASS 151

19 R 4,068,697

CLASS 152

27 4,068,698

CLASS 156

82 4,069,075
83 4,069,076
152 4,069,077
181 4,069,078
212 4,069,079
272 4,069,080
4,069,081
281 4,069,082
329 4,069,083
345 4,069,085
378 4,069,084
4,069,086
391 4,069,087
392 4,069,088
394 4,069,089
498 4,069,090
4,069,091
500 4,069,092
522 4,069,093
612 4,069,094
632 4,069,095
643 4,069,096

CLASS 160

33 4,068,699
351 4,068,700

CLASS 164

16 4,068,701
30 4,068,702
160 4,068,703
4,068,704
270 4,068,705

CLASS 165

1 4,068,706
8 4,068,707
9 4,068,708
95 4,068,709
111 4,068,710

CLASS 166

55.3 4,068,711
156 4,068,712
233 4,068,713
246 4,068,714
251 4,068,715
271 4,068,716
272 4,068,717
280 4,068,718
282 4,068,719
4,068,720
320 4,068,730

CLASS 172

1 4,068,721
123 4,068,722
267 4,068,723
552 4,068,724
801 4,068,725
802 4,068,726

CLASS 173

1 4,068,727
27 4,068,728

CLASS 175

8 4,068,729
339 4,068,731

CLASS 176

22 4,069,097
31 4,069,098
4,069,099
37 4,069,100
65 4,069,101
87 4,069,102

CLASS 178

58 R 4,069,392

CLASS 179

1 G 4,069,394
1 P 4,069,395
1 SD 4,069,393
2 A 4,069,396
6 R 4,069,397
15 AL 4,069,399
15 BT 4,069,398
107 E 4,069,400
115 R 4,069,401
175.31 R 4,069,402

CLASS 180

6.7 4,068,732
77 R 4,068,733
98 4,068,734
128 4,068,735

CLASS 181

224 4,068,736

CLASS 182

63 4,068,737
128 4,068,738
139 4,068,739

CLASS 184

6.12 4,068,740

CLASS 187

29 R 4,068,741

CLASS 188

1 B 4,068,742
71.1 4,068,743
73.3 4,068,744
4,068,745
196 A 4,068,746

CLASS 192

30 V 4,068,747
41 A 4,068,748
45.1 Re.29,520
106.1 4,068,749
111 A 4,068,750

CLASS 193

36 4,068,751

CLASS 194

1 H 4,068,752

CLASS 195

4 4,069,103
31 F 4,069,104
63 4,069,105
68 4,069,106

CLASS 198

373 4,068,753
422 4,068,754
557 4,068,755
653 4,068,756

CLASS 200

51.12 4,069,403
60 4,069,404
84 C 4,069,405
144 AP 4,069,406

CLASS 201

12 4,069,107

CLASS 202

263 4,069,108

CLASS 204

15 4,069,109
29 4,069,110
39 4,069,111
43 G 4,069,113
43 T 4,069,112
64 R 4,069,114
67 4,069,115
96 4,069,116
98 4,069,117
99 4,069,118
106 4,069,119
129 4,069,120
129.3 4,069,121
158 HE 4,069,122
159.18 4,069,123
159.24 4,069,124
4,069,125
224 R 4,069,126
229 4,069,127
258 4,069,128
4,069,129
268 4,069,130
297 W 4,069,131

CLASS 206

363 4,068,757

CLASS 208

11 R 4,069,132
4,069,133
64 4,069,134
65 4,069,135
4,069,136
4,069,137
206 4,069,138
216 4,069,139
251 H 4,069,140
309 4,069,141
310 Z 4,069,142

CLASS 209

10 4,069,143
11 4,069,144
112 4,068,758
4,068,759
212 4,069,145
254 4,069,146

CLASS 210

6 4,069,147
11 4,069,148
44 4,069,149
50 4,069,152
64 4,069,153
66 4,069,154
112 4,069,150
195 R 4,069,155
195 S 4,069,156
433 M 4,069,157

CLASS 211

74 4,068,760
134 4,068,761

CLASS 212

49 4,068,762

CLASS 214

1 CM 4,068,763
1 PA 4,068,764
6 A 4,068,766
6 BA 4,068,767
6 G 4,068,765
64.2 4,068,768
83.18 4,068,769
85 4,068,770
313 4,068,771
505 4,068,772
674 4,068,773
766 4,068,774

CLASS 215

331 4,068,775
349 4,068,776

CLASS 219

70 4,069,407
72 4,069,408
301 4,069,409
535 4,069,410

CLASS 220

1 B 4,068,777
3.2 4,069,448
66 4,068,778
94 R 4,068,779

CLASS 222

5 4,068,780
52 4,068,781
402.13 4,068,782

CLASS 223

1.1 4,068,783

CLASS 224

2 B 4,068,784
5 D 4,068,785
6 4,068,786
26 E 4,068,787

CLASS 225

1 4,068,788

CLASS 226

3 4,068,789

CLASS 227

8 4,068,790

CLASS 228

45 4,068,791
57 4,068,792

CLASS 229

14 C 4,068,793
23 R 4,068,794
31 R 4,068,795
49 4,068,796

CLASS 232

4 R 4,068,797

CLASS 233

26 4,068,798

CLASS 235

92 PC 4,069,411

CLASS 236

49 4,068,799
101 C 4,068,800

CLASS 239

102 4,068,801
419.5 4,068,802

CLASS 241

32 4,068,803
101.7 4,068,804
159 4,068,805

CLASS 242

46.4 4,068,806
47.01 4,068,807
118.4 4,068,808
197 4,068,809

CLASS 244

2 4,068,810

CLASS 246

169 A 4,068,811

CLASS 248

14 4,068,812
119 R 4,068,813
176 4,068,814
188.2 4,068,815
251 4,068,816
340 4,068,817

CLASS 249

42 4,068,818
66 A 4,068,819

CLASS 250

207 4,069,418
302 4,069,419
341 4,069,420
363 S 4,069,421
445 T 4,069,422
493 4,069,423

CLASS 251

11 4,068,820
172 4,068,821
315 4,068,822

CLASS 252

3 4,069,158
8.55 D 4,069,161
8.8 4,069,159
8.9 4,069,160
32.7 E 4,069,162
46.7 4,069,163
62.62 4,069,164
63 4,069,165
4,069,166
299 4,069,167
300 4,069,168
429 B 4,069,169
441 4,069,170
454 4,069,171
455 Z 4,069,172

CLASS 254

89 H 4,068,823
124 4,068,824
4,068,825
134 4,068,826
139.1 4,068,827

CLASS 260

2 A 4,069,174
2.5 AJ 4,069,173
2.5 F 4,069,175
17.4 GC 4,069,177
22 S 4,069,178
23 AR 4,069,180
23 R 4,069,179
28.5 AS 4,069,181
4,069,182
29.2 EP 4,069,210
29.2 N 4,069,184
29.3 4,069,183
29.6 HN 4,069,185
29.6 M 4,069,187
29.6 RB 4,069,186
29.7 T 4,069,188
30.6 R 4,069,189
31.8 M 4,069,190
37 EP 4,069,191
4,069,192
39 P 4,069,176
40 R 4,069,193
4,069,194
45.75 C 4,069,199
45.8 N 4,069,196
45.8 NE 4,069,197
45.8 NW 4,069,195
45.85 S 4,069,200
45.9 KB 4,069,198
45.95 R 4,069,201
47 EC 4,069,202
4,069,203
47 EN 4,069,204
49 4,069,205
4,069,206
75 H 4,069,207
75 N 4,069,209
75 NH 4,069,208
77.5 MA 4,069,211
77.5 SP 4,069,212
78 A 4,069,213
4,069,214
79.3 R 4,069,215
112 B 4,069,216
124 R 4,069,217
153 4,069,218
239.57 4,069,219
293.52 4,069,222
293.62 4,069,221
293.76 4,069,223
295 AM 4,069,224
306.8 R 4,069,225
307 F 4,069,226
308 R 4,069,227
4,069,228
4,069,229
319.1 4,069,230
332.3 P 4,069,231
343.6 4,069,232
347.2 4,069,233
348.16 4,069,234
407 4,069,235
414 4,069,236
437 R 4,069,237
453 P 4,069,238
463 4,069,239
501.12 4,069,244
502.4 P 4,069,246
502.4 R 4,069,245
4,069,247
515 P 4,069,248
519 4,069,249
4,069,250
534 S 4,069,251
545 R 4,069,252
555 C 4,069,253
556 AR 4,069,254
561 N 4,069,255
570 R 4,069,256
595 4,069,257
598 4,069,258
608 4,069,259
632 B 4,069,260
635 E 4,069,261
646 4,069,262
650 R 4,069,263
4,069,264
652.5 R 4,069,265
653 4,069,266
665 R 4,069,267
666 P 4,069,268
4,069,269
668 A 4,069,270
669 R 4,069,271
680 E 4,069,272
683.15 D 4,069,273
836 4,069,274
4,069,275
839 4,069,276
857 PG 4,069,277
860 4,069,278
975 4,069,279

CLASS 264

1 4,069,280
4,069,281
28 4,069,282
32 4,069,283
40.3 4,069,292
43 4,069,284
51 4,069,285
85 4,069,286
140 4,069,287
141 4,069,288
157 4,069,289
297 4,069,290
342 R 4,069,291

CLASS 266

48 4,068,833

CLASS 269

264 4,068,834

CLASS 270

52.5 4,068,973
53 4,068,835
58 4,068,836

CLASS 271

173 4,068,837
4,068,838
180 4,068,839

CLASS 272

3 4,068,840
8 R 4,068,841
113 4,068,842
118 4,068,843

CLASS 273

1 R 4,068,844
42 A 4,068,845
55 B 4,068,846
85 R 4,068,847
218 4,068,849
257 4,068,848

CLASS 274

37 4,068,850
39 A 4,068,851

CLASS 277

34.3 4,068,852
102 4,068,853
237 A 4,068,854

CLASS 280

79.3 4,068,855
179 R 4,068,856
259 4,068,857
289 E 4,068,859
289 R 4,068,858
432 4,068,860
610 4,068,861
740 4,068,862

CLASS 283

49 4,068,972

CLASS 285

39 4,068,863
49 4,068,864
90 4,068,865
105 4,068,866
174 4,068,867
263 4,068,868
316 4,068,869
320 4,068,870

CLASS 292

48 4,068,871
87 4,068,872
101 4,068,873
128 4,068,874
206 4,068,875

CLASS 293

69 R 4,068,876
72 4,068,877

CLASS 294

67 R 4,068,971
83 R 4,068,878

89 4,068,879
90 4,068,880
111 4,068,881
116 4,068,882

CLASS 296

1 S 4,068,883
28 F 4,068,884
78 R 4,068,885
137 B 4,068,886

CLASS 297

216 4,068,887
317 4,068,888
352 4,068,889
355 4,068,890

CLASS 298

7 4,068,891
17 R 4,068,892

CLASS 299

43 4,068,893
45 4,068,894
70 4,068,895
83 4,068,896
91 4,068,897

CLASS 301

5 B 4,068,898

CLASS 303

6 A 4,068,899
6 C 4,068,900
4,068,901
28 4,068,902
99 4,068,903
115 4,068,904

CLASS 305

51 4,068,905

CLASS 307

87 4,069,424
205 4,069,426
4,069,427
215 4,069,428
265 4,069,429
270 4,069,430
355 4,069,431
357 4,069,432

CLASS 308

3 A 4,068,906
18 4,068,907

CLASS 310

168 4,069,435
325 4,069,433
348 4,069,434

CLASS 312

30 4,068,908
257 R 4,069,450

CLASS 313

161 4,069,416
302 4,069,436
315 4,069,437
346 R 4,069,438
422 4,069,439
465 4,069,440
487 4,069,441

CLASS 315

208 4,069,442
395 4,069,443

CLASS 318

114 4,069,444
139 4,069,445
466 4,069,446

CLASS 320

1 4,069,447

CLASS 322

4,069,451

CLASS 324

103 P 4,069,452
158 F 4,069,453

CLASS 325

25 4,069,454
469 4,069,455

CLASS 328

165 4,069,456
235 4,069,457

CLASS 330

4.3 4,069,458
107 4,069,459
257 4,069,460
260 4,069,461

CLASS 331

11 4,069,462
94.5 P 4,069,463

CLASS 337

77 4,069,464

CLASS 338

20 4,069,465
147 4,069,466

CLASS 339

5 R 4,068,909
18 P 4,068,910
90 R 4,068,911
99 R 4,068,912
111 4,068,913
143 R 4,068,914
176 MP 4,068,915
177 R 4,068,916
258 R 4,068,917

CLASS 340

1 R 4,069,467
3 D 4,069,468
5 R 4,069,469
15.5 TA 4,069,470
15.5 TC 4,069,471
146.3 K 4,069,472
311 4,069,477
347 AD 4,069,479
347 DD 4,069,478
373 4,069,480

CLASS 343

6 TV 4,069,481
7.7 4,069,482
700 MS 4,069,483

CLASS 346

33 F 4,069,484
75 4,069,485
4,069,486
76 L 4,069,487

CLASS 350

3 4,068,918
96 WG 4,068,919
4,068,920
117 4,068,921
126 4,068,922
160 LC 4,068,923
4,068,924
4,068,925
4,068,926
160 R 4,068,927
4,068,928
215 4,068,929
277 4,068,930
318 4,068,931

CLASS 351

7 4,068,932
160 4,068,933

CLASS 353

26 A 4,068,934
71 4,068,935

CLASS 354

51 4,069,489
83 4,069,490
267 4,069,491

CLASS 355

1 4,068,936
3 TR 4,068,937
4 4,068,938
4,068,939
4,068,940
5 4,068,941
16 4,068,942
38 4,068,943
45 4,068,944
54 4,068,945
64 4,068,946
72 4,068,947
75 4,068,948
4,068,949
4,068,950

CLASS 356

5 4,068,951
4,068,952
4,068,953
75 4,068,954
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4,068,796
4,068,802
4,069,415
55 : 4,068,330
4,068,338
4,068,397
4,068,409
4,068,415
4,068,452
4,068,567
4,068,636
4,068,644
4,068,682
4,068,687
4,068,696
4,068,824
4,068,886
4,069,092
4,069,217
4,069,348
4,069,464
4,069,465

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4 : 246,947
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6 : 246,948
246,965
246,966
246,973
246,977
246,980
246,995
247,003

8 : 246,991
246,992
246,993
9 : 246,987
12 : 246,959
246,988
17 : 246,946
246,950
246,951

246,952
246,957
246,972
246,974
18 : 246,942
21 : 246,978
246,990
25 : 246,949
246,955
26 : 246,974

246,998
27 : 246,962
246,963
246,964
246,994
29 : 246,969
246,971
33 : 246,945
34 : 246,941

246,958
246,968
36 : 247,000
247,005
39 : 246,986
246,989
41 : 246,985
42 : 246,956
44 : 246,954

246,960
45 : 246,953
47 : 246,967
48 : 246,976
246,979
246,983
246,984
53 : 246,982
246,999

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12 : 4,187
39 : 4,190
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54 : 4,188

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